Gleanings in Bee Culture

November, 1958 Vol. 86, No. 11

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Subscription Rates: United States, Canada, Pan American countries, and Spain, one year, $2.00; two years, $3.50; three years, $5.00. Single copy, 20¢. Other countries, 50¢ per year additional for postage. Published monthly. Discontinuance: Subscriptions stopped on expiration. No subscriber will be run into debt by us for this journal. Change of Address: Give your old address as well as the new and write the name to which the journal has heretofore been addressed. Remittance should be sent by post office money order, bank draft, express money order or check. Contributions to Gleanings columns solicited. Stamps should be enclosed to insure return of manuscript to author if not printed. Advertising Rates: Advertising rates and conditions will be sent on request. Results from advertising in this journal are remarkably satisfactory. Advertisers' Reliability: While the publishers do not guarantee advertisements in this journal they use utmost diligence to establish in advance the reliability of every advertiser using space in this journal.

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POSTMASTER: Send Form 3579 to 623 West Liberty Street, Medina, Ohio.

Second Class Postage paid at Medina, Ohio.

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Monthly HONEY Report

WALTER BARTH
Field Editor
San Antonio,
Texas

IT IS OPENLY conceded that new products are needed to help stabilize our industry. Hence this writer has always brought to your attention new beekeeping products. Now a real "humdinger" has come to my attention and here it is:

Fried Baby Bees

Interested in something different? Then try Reese's fried baby bees .... only $1.29 for a 3½-ounce can. The packers describe their new product as "Delectable little dears. Choice of the hive. In an exotic soy sauce that puts guests a-buzz". Still interested? Then order H-3195—Fried Baby Bees—from Sunset House, 100 Sunset Building, Beverly Hills, California. Their free catalog lists other unusual cocktail snacks also.

New Gleanings Look

Prior to discussing honey prices I am taking this opportunity to draw readers' attention to the new appearance of Gleanings resulting from a new and more expensive printing method. To continue with this method requires the support of the readers of this column. This writer urges you to write to the Editor and express your opinions. Your opinions are necessary to justify a better presentation of this column. Just a postcard message will do, and above all, do it now. Thanks for your help.

National Picture

Retail honey prices have remained fairly steady in spite of growing wholesale and packers' inventories. Here are the general average national retail honey prices:

Liquid Extracted Honey

Size of Jar	Price
8 oz.	$ .23 to $ .25
1 lb.	.39 to .42
2 lb.	.69
3 lb.	.89
4 lb.	1.19 to 1.21
5 lb.	1.39 to 1.50
10 lb.	2.25

The most price variation can be found in the 5-lb. size where retail prices as low as $1.00 are being reported. Here is one size that meets the competition of small beekeepers who dump their honey at any price rather than sell it slowly at a fair price. Many do not figure operating costs at all and hence come up with real low prices.

Comb honey is still bringing $8.00 to $10.00 per case in spite of the comparatively small national crop. The lack of promotion probably is a big factor here as well as the lack of any continuous supply and the spoilage problems.

Wholesale honey prices are fairly constant although down about one cent per pound over this period a year ago. Packers are slow to buy, and when active are demanding new cans. A trend toward drums is developing because of the poor quality of the standard 60-lb. honey can.

Wholesale prices for white honey are settling around 11¢ per pound and 9½ to 10¢ per pound for amber honeys. Some 12¢ purchases for white honey have been reported and even 12½¢ for west coast sage honey.

The national beeswax market is sluggish. Processors generally have a good supply and there is no hurry to buy. Prices are still much the same as last month and still no difference shown for color. In the western states, beeswax is bringing 42¢ per pound and in the South, Midwest, and East, 45¢ per pound is the standard price.

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1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher. The A. I. Root Co., Medina, Ohio.
Editor: M. J. Deyell, Medina, Ohio.
Managing Editor: John A. Root, Medina, Ohio.
Business Manager: Alan I. Root, Medina, Ohio.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address as well as that of each individual member, must be given.)

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semi-weekly, and tri-weekly newspapers only.)

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ORPHA P. WAGNER, Notary Public. (My commission expires August 4, 1960.)

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Mr. and Mrs. Arthur Schultz, Ripon, Wisconsin, founders of the Schultz Honey Farms. In retirement they are having lots of fun traveling, attending meetings, reading and writing.

The Story of
A Pioneer in Beekeeping

When the history of beekeeping has been written the most interesting stories will be the experiences of the men who started with one colony and ended by devoting most of their lives to producing and marketing honey or queens and bees.

H. J. RAHMLOW
St. Petersburg, Florida

ONE OF THE most colorful of these pioneers in Wisconsin is Mr. Arthur Schultz—"Honey Schultz" they call him in Ripon, where he was born on a farm in 1884. He obtained his first colony of bees in 1901 and his early experiences with them would not have brought him any votes by Ripon folks as the "man most likely to succeed". No one, not even he, would have predicted in those years that some day he would be Wisconsin's largest beekeeper and produce and handle a half million pounds of honey.

Indeed, his first experiences as a beekeeper were much like those of thousands of other amateurs who have become fascinated and thrilled with the mysteries and possibilities of a colony of bees. Anxious to "increase", he

divided that first colony late in the season. Inexperienced in the amount of food required for wintering, both colonies were dead the next spring. Winter starvation is one of the tragedies of beekeeping.

It is at this point that the old expression "separate the men from the boys" can be used in Art's case. He could easily have quit right then as so many others have done—if not the first year—at least within a few years. However, he had been "bitten"—and so bought more bees; studied all the literature he could find; consulted other beekeepers; attended meetings and cautiously increased his number of colonies. During this time he was a rural mail carrier, traveling the route with horse and buggy or sled. In those days before the auto, roads were never opened in winter, but the mail had to go through. Ill health forced him to give up this work. He tried other work, but his first love was beekeeping. He just couldn't get them out of his mind. In spite of his doctor's advice to "take it easy" and the skepticism of his parents he kept on. The thrill of establishing his own business, of being his own boss, of working outdoors with his own bees and perhaps some day making more money than he could at any job he had held, kept him nailing equipment and increasing his colonies.

It took until 1917 before he could establish his first out-yard—16 years after he bought his first colony in 1901. Now, however, with five years of summer work as a deputy apiary inspector to teach him by observation the best methods known at that time for managing bees, he went ahead rapidly, establishing one out-yard after another until he was indeed, a full-time commercial honey producer. When that time came he was, however, faced with a still greater problem—that of selling larger crops than could be absorbed by local markets. That meant becoming a business man and is a story in itself.

Early Experiences

Early beekeepers had to work long hours and with little modern equipment. Art drove to his out-yards with one horse and "Democrat" wagon. This horse "Lady" served him many years on the mail route as well. Bees usually do not like horses, and so it was necessary to get to the outyards early, before the bees were flying and work late after they had quit flying. Until 1920 "Lady" hauled the supers and honey and in that year a run-about truck was available and "Lady" was retired. What a day that must have been for both Art and "Lady!"

Early Equipment

More progress has been made in the last 30 years in the production and invention of labor-saving equipment and machines for extracting and handling honey than in all of history before that time. The next ten years will see still greater progress as we produce equipment for lifting heavy hives, for faster extracting, heating and cooling and better clarifying. This will result in far better honey—lighter in color and retaining its delicate flavor and aroma. Mr. Schultz started out with a two-frame hand extractor. When one side had been extracted, the machine was stopped and the combs reversed by hand. It was a great day when he was able to purchase two 4-frame Lewis Markle automatic reversible machines, a great invention in the 1920's. He used these machines until 1935. Now three large radial extractors are used.

Swarm Control

The "Demaree" method of swarm control was perhaps the first successful method developed during a time when not a great deal was known about swarming and its causes. Mr. Schultz used this method until 1940, when he found it impossible to devote the amount of time necessary to find the queen in each of a thousand or more colonies and place her with a frame of brood in a brood chamber of empty combs below an excluder. He then devised a method which met his needs in his particular locality. By providing plenty of room for the queen and colony by the use of more than one brood chamber and giving honey supers before they were really needed, he has solved this important problem.

Marketing Problems

As so many others have done, Art at first produced only comb honey because an extractor was not required. However, as he expanded, he went into production of extracted honey which was sold to neighbors who brought their own containers to the home—which was also his extracting room. He

At the right is the honey receiving door, extracting room, honey storage, heating and bottling rooms. At left is new storage building for supplies.

took some honey to local stores in green fruit jars which was disastrous, as many of us have also learned. The green glass made the honey look sickly and it leaked out of the covers onto the shelves so that the storekeepers wanted to throw out both the honey and Art.

Finally when white glass jars and tight caps appeared, Mr. Schultz was able to extend his sales to such a distance as "Lady" could travel in a day. As production increased he began to call on the wholesale grocers and other large buyers who would ask "Whose honey are you selling?" When he said "Schultz's" they replied, "Never heard of it; not interested". They bought only known brands—and how do you get your brand known if no one will handle it?

These were some of the heart breaking problems which only the determined man will solve. Mr. Schultz says "A friend in need in those days was a friend indeed". Some buyers who helped us in the early days are still with us.

The wholesale price of honey on the Chicago market before World War I was five cents per pound. To increase demand Mr. Schultz tried many experiments to find new markets for honey. He tried making a dessert of powdered milk and powdered honey to which only water need be added. He experimented with many kinds of candy of honey and milk combinations. Then about 1940 in cooperation with a leading Ripon physician, Dr. J. M. Johnson, the latter tested a milk and honey formula for infant feeding. This was very successful and the formula was released after about four years of work.

We have always felt that much more should have been done in the promotion of honey for infant feeding, but there seemed to be difficulty in mothers being able to obtain a proper grade of honey readily. The experiments proved that a simple and inexpensive formula of milk and honey gave results in infant feeding equal to any and superior to many others in use at that time.

Here is the formula which Dr. Johnson tested for about four years—Mr. Schultz furnishing the honey.

For new-born infants:

Evaporated milk	5½ ounces
Boiled water	10½ ounces
Honey	2 tablespoonfuls

When the infant is about two weeks old, the formula is changed to:

Evaporated milk	6½ ounces
Boiled water	9½ ounces
Honey	2 tablespoonfuls

If the infant grows rapidly and takes considerable for each feeding, or fusses as though not getting enough, a stronger formula may be given:

Evaporated milk	8 ounces
Boiled water	8 ounces
Honey	2 tablespoonfuls

Formulas of homogenized and soft curd milk with honey have also given wonderful results.

An Experience with Cooperatives

There was a day when beekeepers were told that a honey sales co-op was the only way to get a better price for their honey. The solution, they were told, was to "pool" all the honey and sell it cooperatively. Wisconsin beekeepers have had several experiences in pooling honey, and it has left them much wiser and a few of them poorer. Mr. Schultz has in his files a formal looking document dated June 24, 1926: Articles of Incorporation of the Wisconsin Cooperative Honey Marketing Association. It was located in the city of Ripon and Mr. Schultz was the Secretary-Treasurer. Promoters said the organization was necessary "to keep the beekeepers from going out of business". The plan was to pool the honey, store it in a warehouse in Ripon and then sell it. Today Art will tell you that he thinks it was lucky the beekeepers did not bring their honey and that he didn't have to sell any—and so no one lost any money.

In a later effort in "pooling" on a national scale, several Wisconsin beekeepers lost their entire season's crop when the organization failed.

We intend no reflections on the very successful cooperative organizations now in existence which were located where they were really needed and founded on sound business principles. We will always remember the words of our Professor of Agricultural Economics who said in a lecture: "Before you start a co-op, be sure it is needed".

Mr. Schultz says the reason why Wisconsin beekeepers did not organize a co-op is because they were satisfied with their markets. In this state three beekeepers started out many years ago in honey production (Mr. Schultz is one of them), built up their markets, both wholesale and retail, by strenuous efforts and honest business methods. They expanded and began buying honey from beekeepers. They have enjoyed the confidence of the beekeepers for many years and would offer almost insurmountable competition for a new co-op. A number of beekeepers also belong to the Sioux Honey Association.

Honors

In November of 1942 Mr. Arthur Schultz was awarded honorary recognition by the Wisconsin State Horticultural Society "for his achievement in developing one of Wisconsin's most successful apiaries and for his leadership in advancing the beekeeping industry".

In 1939, while he was president and with the help of loyal members, the Wisconsin State Beekeepers' Association secured an appropriation of $31,500 for bee disease eradication work in the state, the largest amount the state ever appropriated.

It was Mr. Schultz's success as a presiding officer for which we greatly admired him and which enabled him to build up this state association.

There comes a time in the life of most organizations when differences of opinions create factions; lack of diplomacy on the part of officers may result in coolness at meetings and then interest falls off. Have you ever attended meetings at which you would have liked to express your appreciation by applauding a good speaker but were restrained because no one else did—no one started it? Mr. Schultz had the personality and good will to create enthusiasm while conducting a meeting. When he introduced a speaker, he would tell something about him and then say "I know Mr. Blank is going to give us a fine message, let's give him a good hand". The applause helped the speaker, eased tensions and everyone seemed to have a greater appreciation for the program and a desire to listen. At the close of a talk he would lead in the applause and then thank the speaker without permitting interruptions. Members became more friendly and membership grew.

To Mrs. Schultz

It is doubtful if we ever give enough credit to our wives for our success and so we must mention the tremendous amount of work which Mrs. Schultz gave, especially in the early days. She gave encouragement and did a great deal of work at a time when there was very little equipment, when income was low and all spare cash had to be invested in more bees and hives. At such a time help and encouragement often mean the difference between success

Truck brings in a load of honey for extracting. Three men haul in two such loads per day.

and failure or determine the desire to continue.

Not only did Lottie Schultz, as her many friends call her, help with the extracting and bottling, she was also very active in the promotion of honey. She contributed greatly to the success of several organizations where her enthusiasm and faith were an inspiration. She was the first secretary of the National Beekeepers' Auxiliary. She helped organize the first auxiliary in 1935 and was its first Secretary for five years, and President for three more years. She has attended nearly all the National Auxiliary meetings. She has been active in promoting honey by working at the Wisconsin State Fair honey exhibit and operating a honey-baked ham sandwich booth at nearby County Fairs at Oshkosh and Fond du Lac. Whenever there was an opportunity to promote honey, Mrs. Schultz could be relied upon to help.

Mr. Joe Mills Enters the Picture

In an early issue we hope to tell you more of the continued development of the Schultz Honey Farms. The Schultz's have only one daughter. Every man, on retirement, likes to see the work of a lifetime continue in the hands of a member of the family. The right man came along—thanks to an ad in Gleanings in Bee Culture. Mr. Joe Mills came from Pennsylvania to work with the bees and learn beekeeping. The young folks fell in love, were married, and now there are three grandchildren. Joe is making an outstanding success of handling 2000 colonies of bees and a half million pounds of honey.

ONE WAY TO CATCH A SKUNK

SPENCER BAIRD, Cazenovia, N. Y.

PRACTICALLY EVERY bee man has tht problem of skunks in his bee yards. Of course, the simplest solution is strychnine and half a raw egg, but I find two small pieces of cheese with the poison between, the handiest.

But here at my home yard there are too many cats and dogs to take a chance, so use a barrel, either wood or metal, set on a board so that when the cat or skunk goes in, the barrel overbalances with the weight and sets upright. If it is a cat it jumps out but if it is a skunk he stays in and from here on he is your problem.

There must be a bee hive or stake behind, so the barrel will not go on over. I smash a raw egg in the bottom with some grass to hold it.

Successful Grafting With Beeswax

Every commercial prune tree grown in Santa Clara County is the product of grafting or budding. Non-grafted trees or seedlings, are slow in bearing, yield irregularly, and often produce fruit that is not uniform or true to type.

RICHARD E. NIEMAN
San Jose, Calif.

THE MAIN OBJECTIVE in grafting is to secure the highest number of successful "takes" during the initial grafting operations at the start of the grafting season.

Second-round grafting or the re-grafting later of plants which failed to grow, results in a loss of growth-time which can never be regained. Due to

San Jose Chamber of Commerce Photo.

the time, material, and labor wasted, orchard profits are affected. Even the parent plants or rootstocks which are subjected to re-grafting may be adversely affected by a second cutting-back or pruning which may be necessary in the placement of new grafts. Thus, the importance of proper grafting procedure can be readily understood. Grafting compounds, necessary materials in grafting work, have an important part in this procedure.

After seven years of orchard grafting involving walnuts, prunes, apricots, and other deciduous fruit, we have found that better results have been consistently attained by using grafting compounds containing beeswax as compared to as-

Our County Agricultural Director, L. C. Barnard completing a demonstration on top grafting of walnuts using beeswax grafting compounds.—Agricultural Extension Service Photo.

French prune scions successfully grafted onto wild myrobalan plum stock which is resistant to root fungus. Grafting makes it possible to combine the best variety of fruit with the most suitable type of rootstock.—R. Nieman Photo.

phalt emulsions which we have also used.

Asphalt emulsions are soft, paste-like materials ranging from a dark brown to black in color. The product is usually applied with a brush as it comes from the can. It may be thinned with water and remains soluble until it dries, when it hardens and becomes waterproof.

During the early spring grafting season, rainfal restricts the use of asphalt emulsions in grafting operations. If emulsions are used and rainfall should occur at the time of grafting or soon after, the applied material is likely to be washed away from the grafts exposing them to the air and subsequent dry-out. Furthermore, the emulsion becomes so thinned that it can seep in between the newly united plant layers and interfere with proper healing. This has been verified upon the removal and examination of grafted scions which had failed to grow under these conditions.

On the other hand, no losses from the above causes have occurred when melted beeswax compounds were used. Melted grafting wax flows into graft crevices, coats the exposed surfaces and dries quickly, producing a permanent seal that is air tight and impervious to water. (Coated graft-buds appear to have no difficulty in breaking through this material when sprouting.)

When coatings of beeswax compounds have been used, sunburn has been observed less frequently. This condition is noticeable in late spring and more so during summer operations.

Under certain conditions, honeybees, in their search for propolis, will remove beeswax compounds as well as asphalt emulsions from plants. This can be prevented by wrapping the coated parts with strips of cloth, paper, or inexpensive masking tape. Paper bags with small perforations for ventilation may be used to protect terminal grafts. (See Gleanings, June 1953, "Bees Present Problem in Orchard Grafting.")

Grafting waxes may vary greatly in consistency, ranging from fluid to solid forms, depending on the ingredients selected and their proportionate use. Some of the materials used with beeswax in various formulas are: Resin, linseed oil, tallow, fish glue, turpentine, alcohol, lampblack, red pigment, and even flour. Bottled liquid forms, high-

ly evaporative, are applied cold with a brush and dry immediately. Ductile types, semi-hard yet pliable, are applied with the hands. Hard types are used in a melted form with a brush. They are the most popular and are widely used here. Although we have had good results with the different wax compounds which are sold on the market, we prefer to make our own grafting wax, and the saving thus effected is considerable. Our wax supply comes from our apiary which we operate in connection with the 285 acre orchard and farm. We are able to make grafting wax for less than one third the market price which averages a dollar per pound.

After trying out different combinations and mixtures, we have adopted a formula which aside from being satisfactory and of good quality, is reasonable in cost, easy to make, and the materials are readily available. This formula is similar to that described in the University of California's revised bulletin on Plant Propagation. The materials and amounts listed will make about 6½ pounds of grafting wax at a cost of $2.10 or 32¢ per pound. For smaller quantities, the same proportions but lesser amounts are used.

1 lb. beeswax
(small pieces melt easily)
4 lbs. resin
(crushed into powder—helps in melting)
1 ounce lampblack
1 pt. **RAW** linseed oil

Pour the raw linseed oil into a double boiler, (or any water-jacketed container), add resin and beeswax, melt mixture and while stirring add the lampblack. Then pour into molds and let cool completely. Soaped molds lessen sticking. Wax cakes formed in small muffin pans make a convenient size for handling. Cakes formed in large molds may be broken up later into chunks as needed. If cakes are difficult to remove after they have hardened and set, simply heat pan over flame just long enough to melt the edges of the cakes and then remove.

Commercial resin obtained at farm supply stores currently sells for 35¢ per pound. Some drug stores also handle resin. Raw linseed oil (62¢ per pint) and lampblack (8¢ per ounce) are available at paint stores. A pound of

HOMEMADE GRAFTING HEATERS. — Left: covered type. Right: open-top type. Center: converted kerosene lantern—tin cans with ends removed take the place of missing globe and top. Wax is heated in a removable can placed in chimney. For protection against wind, unit may be set in a box with one side open. — R. Nieman Photo.

salt-free mutton tallow may be substituted for the raw linseed oil.

The lampblack (or an ounce of red pigment) is added to give the wax a color in contrast to that of the trees so one can readily see when grafts are covered. It is good practice after grafting with any type of compound to reinspect the grafts and touch up parts missed including any exposed pockets which may have developed. This is repeated again a week or so later.

Impregnated wrapping and tying materials for grafts, easier to use in warm weather, can be made by dipping soft cotton string, No. 18 cotton knitting yarn, and half-inch strips of thin cotton cloth into hot melted grafting wax. Strips of tough, thin paper brushed with hot wax may also be used. We usually prefer to first tie the grafts with untreated soft cotton string or raffia (palm fiber) and then coat with wax. After grafts and budded stock have "taken" and growth has started, the tie strings and other wrappings should be cut so as not to constrict the expanding growth. If rubber budding bands are used, cutting is unnecessary.

A simple heater for orchard work can be made from an empty five gallon paint can, lubricant pail, or the like. An air or draft opening is made on one side near the bottom. A slow fire or

B & Z Library

Our compatible "Family-orchard Tree" produces sweet almonds, apricots, prunes, peaches, nectarines, and plums from top-graftings made on old bitter-almond tree.—R. Nieman Photo.

some wood-coals heats a wax pot which hangs from a rod fastened across the open top. A wire handle makes the outfit portable. (An improvised grill-stove can be made by placing a rack across the top and fitting a grate in the can which is supported by two rods pierced through the sides at the desired height.)

When using beeswax compounds, apply the melted wax at a reasonable temperature. If wax is allowed to overheat or boil it can damage and destroy buds and graft wood, and can even burn the bristles off the applicator brush.

It is not the intention to condemn asphalt emulsion compounds. They have their place, and are easy to apply. Although they are cheaper than quality beeswax compounds, the comparative cost is unimportant since so little material is used for the amount of work performed. Furthermore, if the degree of success in grafting is influenced by the type of compound used, comparative price factors can hardly be considered. We have used asphalt emulsions with success under certain conditions. However, based on our experiences over a considerable period of time and under all weather conditions, beeswax compounds have proved to be consistently the best.

Beekeeping Experiences in the New Hebrides

The native bees were hard to control.

JOHN SCHNEIDER
Buckley, Illinois

I READ Mr. Moore's story of Bees on New Hebrides Island. It reminds me of the time I was in the U.S. Navy, stationed on Esperito Santo, New Hebrides.

While stationed there from November 1943 to May 1945 I caught four swarms of bees, putting them into dynamite boxes which were about the size of eight frame hives. These bees were of Caucasian strain but sure did not act like the pure race.

I tried to make increase with one strong hive but it didn't work out. When I made a nuc hive and put in four crooked combs which I cut out of a strong hive and set them aside, the queens hatched out, built up strong, and then left, bees and all, not a bee left in the hive but plenty of brood. I never could figure that out.

During the 17 months on this Island my bees swarmed a lot. I tried to give them super room and to cut cells but that didn't stop them. Not having removable frames in the boxes I couldn't cut all cells. These bees never did make much honey, just filled up the brood nest and hung out and swarmed. I thought I knew all the tricks of bee keeping to make these bees work for me as I had been keeping bees for four years before going into the service.

As Mr. Moore in his article stated, the natives were very scared of bees. I had to move my four hives 1½ miles back in the jungle next to a coffee plantation. I set them near a path but the natives soon made a new path around these hives. All the men in my outfit liked honey but didn't want the bees right in our living area where I first had them so I had to move them once a month. I would cut out some honey and give it to the cook in our outfit. It seemed to take the bees nearly a month to fill up the cut out comb. With all the flowers and plants blooming most of the time you would think they would make a lot of honey but it surely was a disappointment.

I asked a missionary from Scotland about these bees on the Islands, where they came from, if some one had shipped them in, as there were many bees in hollow trees and logs in the jungles. He told me that in 1930 one of the plantation managers had gotten some bees from Australia. I don't remember whether it was packages or hives. He soon gave up his beekeeping on Espirito Santo as he had the same problems I had.

I left the New Hebrides Islands in May 1945 and moved up to the Mariana Islands, Guam, for six months. I saw one 10-frame factory-made hive there, all that was left of a 20-colony yard owned by a Chamaro native. He said when the Japs took over the islands he took to the hills and when he returned in a few weeks his bee yard was destroyed. The Japs set up a machine gun and shot them up leaving him one empty hive and he had no way of filling it up again. I asked him where he had obtained his bees and he told me some one in California had sent him package bees in 1939. He had a bee veil, a small smoker, and an old 1940 Sears, Roebuck catalog from which I suppose he ordered most of his bee equipment. I often wonder if he ever got back in the beekeeping business again.

Tea time on Kangaroo Island, S. A. Left to right: Dr. Calagham, director of Agriculture, S. A., Mr. North, administrative assistant to Dr. Calagham, Mr. Mitchel in charge of the queen breeding project, Mr. Dowll, Waite Institute, Dr. J. E. Eckert.—Photo by Mr. Swan, Waite Institute of Agricultural Research.

The Kangaroo Island Ligurian Bees

We had been fortunate in having beekeepers from Australia visit us at the University of California, and Mrs. Eckert and I looked forward to returning the visit of Murray Charlton and Al Eastley in their native surroundings.

J. E. ECKERT
University of California
Davis, California

IN THE FALL of 1957 I was given the opportunity of spending six months in Australia on a Fulbright Research Grant to study the beekeeping conditions of that country and to investigate the variety of Ligurian bees on Kangaroo Island. Headquarters was at Waite Agricultural Research Institute, Adelaide, South Australia. My interest in Australia and in the Ligurian bees had been stimulated by correspondence with Mr. D. C. Swan, head of the Department of Entomology at that institution. Australia had always been a land of interest because of the many references to their beekeeping

industry found over the years in our bee literature. We had also been fortunate in having beekeepers from Australia visit us at the University of California, and Mrs. Eckert and I looked forward to returning the visit of Murray Charlton and Al Eastley in their native surroundings.

Kangaroo Island is approximately 90 miles long by 30 miles wide at its longest and widest parts. It lies roughly 100 miles southwest of Adelaide across the Gulf of St. Vincent and is separated from the nearest point on the mainland, Cape Jervis, by approximately eight miles of water across the Backstairs Passage of the Southern Ocean. Another mile or more of sandy and rocky terrain on either side of the water adds to the distances bees would have to fly from one to the other land area.

Kangaroo Island is generally rolling land with some rugged ravines and shore lines, particularly on the western third of the island. Approximately 200 square miles or 10 per cent of the western end of the island has been set aside as a wild life sanctuary and it is in that area where the state operated apiaries of Ligurian bees were located until recently. In February, 1958, a destructive fire swept over about three hundred thousand acres of this sanctuary, which is known as Flinders Chase, and temporarily destroyed much of the bee pasture. Fortunately, the Eucalyptus can withstand such fires and recover within a few years. It takes somewhat longer for the ground cover to replace itself.

The land has been developed over the years by settlers and by the Lands Development Executive for war veterans, and a considerable portion of the island has been brought under cultivation for pastures and grain. Several small streams and rivers provide drainage and sources of water although most of the farms and settlements depend on tanks and reservoirs to store rain water. Wells or "bores", operated by windmills, augment this water supply. After being cleared the land is topdressed each year with superphosphate and small amounts of zinc, copper, or other micro-minerals where research indicates a soil deficiency in such minerals.

Kangaroo Island has many attractions as a winter resort area, particularly on the eastern end around the

Typical Australian hive with wedge fasteners and entrance stop.

American River and Penneshaw. Kingscote is the largest settlement and is situated approximately 68 miles from Flinders Chase. The only settlement in between these points is at Parndarna where the state research headquarters is located. The land is generally covered with malleebroom bush associations with the predominant growth being various types of eucalyptus, yacca, banksia, and numerous low growing shrubs. Kangaroos and wallabies are still present on many parts of the island, although they are being thinned out by the settlement of the land. Koala bears are fairly numerous in favorable locations on Flinders Chase.

Transportation to the island is by slow steamer between Port Adelaide and Kingscote, and by air.

Introduction of Ligurian Bees

The first Ligurian bees are reported to have been introduced on the island in 1884, coming from Queensland. (How they arrived in Queensland was not determined.) Subsequent importations of Ligurian queens were made

Typical grass trees (Black boys) and Mallee on Kangaroo Island, S. A. Remains of one hive after a fire had passed over and through the apiary burning much of the ground cover.

from Naples, and it was thought that this variety was the only one on the island by 1886. The "Ligurian Bee Act" was passed in 1885 making all of Kangaroo Island a sanctuary for this variety of honeybee. Some queens were reared and distributed during the following years and then interest in the bees seems to have lagged until about 1939. Apparently there are very few official records of beekeeping activities on the island prior to 1884 and for many years between 1895 and 1939. In 1939, Mr. Masterman, Apiary Inspector for the State Department of Agriculture, visited the island and found that the bees had prospered in the intervening years with hundreds of swarms being established in trees and caves on most parts of the island. He also noticed that the bees were remarkably uniform in color and extremely docile when handled.

Mr. Wiedenhofer then became interested in rearing queens on the island and did so along the Cygnet River. In 1944, the Department of Agriculture started a queen breeding program on Flinders Chase, with Mr. Ophel in charge, and by 1945 he had transferred 100 colonies of bees to movable frame hives. Mr. Masterman took over the task of rearing queens in that year. The number of colonies was increased gradually to 300 by 1950 and then reduced to approximately 200, plus the nuclei for queen rearing.

Queens have been sent from Kangaroo Island to beekeepers in the various Australian states, and to New Zealand, Egypt, Colombo and Germany. The value of the honey produced has reduced the cost of the project to the taxpayer by a considerable extent. In 1948-1949, the bees produced 25 tons of honey and in the following year 15 tons. The bulk of the honey comes from the gum trees—blue, red, manna, pink, sugar, water and cup gums which grow along the rivers and creeks. Also, mallee, yacca, banksia and stunted stringy bark, and a profusion of wild flowers provide a poorer grade of honey but all helped to make the island a favorable place in which to keep bees.

A Visit to Kangaroo Island

Mr. Keith M. Doull, Entomologist, Waite Institute, and Mr. Masterman of the State Department of South Australia, accompanied me on my first visit to Kangaroo Island and we were met there by Mr. Ted Mitchell, who was in charge of the project. We camped out in a concrete hut for a week, with Mrs. Eckert getting her first ex-

perience with a small wood cook stove.

Many small apiaries are operated by amateurs on different parts of the island, but no commercial apiaries at the present time.

Approximately 300 colonies of bees were examined in hives, nuclei, trees, caves and buildings on different parts of the island but with a majority of them being on or near Flinders Chase. Samples of bees were taken from a majority of the hives and many colonies were examined to study the brood and queens. In the evenings, we examined the samples of bees again for color, size and for signs of Acarapis. No symptoms or signs of Acarapis woodi were discovered. (None have ever been reported from Australia.)

The bees were extremely gentle although they were examined at times under adverse weather conditions. We found them remarkably uniform in color, tending toward the dark, leather-colored Italians. A great majority were three-banded with brownish-yellow bands, bordered with black. Some colonies were somewhat darker than others and in these there was a greater percentage of bees with only one or two brownish-yellow segments on the abdomen. I had anticipated the division of the bees into dark and light Italians, with some black colonies—if black bees had been introduced in past years—but such was not the case. On this visit, no colony was found with bees that were black. Later, Mr. Mitchell sent us some bees from two colonies that appeared to be darker than average and the samples consisted of the darkest bees. A great majority of the "black" bees showed some brownish-yellow color when wet with water or alcohol.

A close check of samples taken from 24 random colonies on Kangaroo Island gave the following number of brownish-yellow bands.

No. of brownish-yellow bands

	1	1.5	2	2.5	3
No. bees	0	0	16	156	230

The thorax of the worker bee was black with light brownish hair. The posterior ridge of the mesothorax, the scutellum, generally was the same color as the rest of the thorax, being a medium to a dark brown on only a small number of bees. (Our lighter 3 to 4 banded American-Italian workers have this portion of the thorax the same yellowish color as the first segments of the abdomen.) Three bands of buff colored hair, alternated with black bands following the colored segments, give the workers a distinctly banded appearance that is quite striking in sunlight.

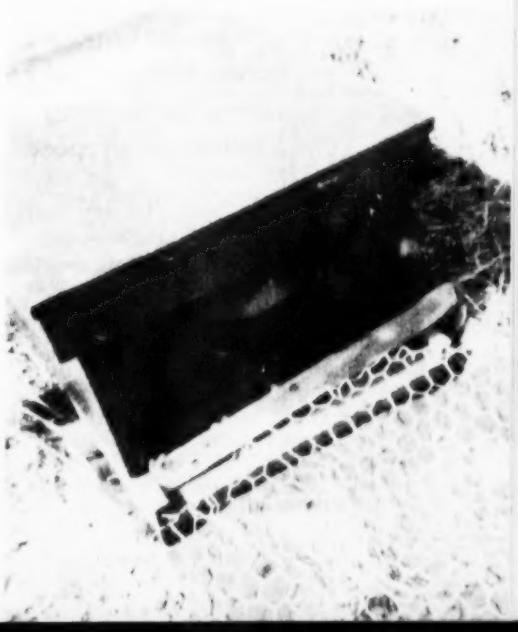
(To be continued next month)

It's an Idea

MILTON H. STRICKER

Stockton, N. J.

LIVE IN an area where it's unadvisable to use poison for your skunk problem? Just place the front of your colony on a piece of chicken wire. Skunks seem loath to tamper with such a colony. A few stones will hold the front edge of the wire, if necessary.



*Honey is "HYGROSCOPIC"

A knowledge of the hygroscopic properties of honey is desirable in order to understand how nectar is ripened into honey; how to best handle honey to avoid excessive water content and how honey behaves when used for cooking or industrial purposes.

E. C. MARTIN

East Lansing, Michigan

THE DICTIONARY states that hygroscopic substances absorb water from the air. When used in connection with honey it is best to think of the term as implying an exchange of water between honey and the air surrounding it. Beekeepers know that if honey is left exposed in a dry room it will lose moisture and become very tacky or sticky. On the other hand, if a comb or a dish of honey is left in a room where the relative humidity is high the honey absorbs moisture and becomes watery. That is, in moist air, water molecules pass from the air into the honey, whereas in dry air, water molecules pass from the honey into the air. Tests have shown that there are also points of equilibrium where a balance exists between the water present in honey and the relative humidity of the air. Martin (1939) showed that if honey of 17.4 per cent moisture was stored at 58 per cent relative humidity no exchange of moisture took place.

Honey Moisture is Important

The hygroscopic properties of honey are important from the time honey is present in the flowers as nectar, until it is consumed. Honey bees make use of this physical property of honey when they distribute small droplets of nectar in the cells so that a large surface area will be exposed to drying. By fanning their wings vigorously they keep the air in circulation, thereby eliminating moisture from the hive. The temperature and humidity of the air outside the hive influence the degree to which nectar may be ripened into honey. This is indicated by the fact that honey from the semi-arid areas of western United States is consistently lower in water content than that from the more humid areas of the east.

In general honey of high water content is more subject to fermentation than honey of low moisture content. In the United States first grade honey must not contain more than 18.6 per cent water. In Canada first grade honey cannot contain more than 17.8 per cent water. Fix and Palmer-Jones (1949) stated that New Zealand honey of less than 17.2 per cent moisture did not ferment and Lochhead (1934) in Canada stated that honey of less than 17.1 per cent moisture would not ferment in 12 months. Beekeepers in humid areas can profitably and economically reduce the water content of

* Journal Article 2317 from the Michigan Agricultural Experiment Station.

comb or extracted honey by exposing supers of honey to dry air in hot rooms. Many beekeepers have added drying rooms to their honey houses and the practice will likely increase.

A knowledge of the hygroscopic properties of honey is desirable in order to understand how nectar is ripened into honey; how to best handle honey to avoid excessive water content and how honey behaves when used for cooking or industrial purposes. Experiments were undertaken by the writer to study the hygroscopic properties of honey in some detail. The effect of water absorption on fermentation has also been studied and will be discussed in a later article.

Summary of Experimental Work

Honey samples in glass vials and in beeswax containers were exposed in a series of chambers in which the relative humidity was accurately controlled by means of salt solutions. Samples of liquid, crystallized and comb honey and also samples of dextrose and levulose, the two principal sugars of honey were exposed in these controlled humidities at a temperature of 68 degrees F. The water content of the original honey samples was determined. All samples were removed from the chambers periodically to be weighed to 0.0001 grams. Knowing the original water content, the moisture content at each weighing could be easily computed and an accurate record obtained of the way in which honey absorbed or gave off moisture in any relative humidity.

Interesting Results

It was found that honey could absorb a great deal of moisture at quite a rapid rate. For instance one sample of liquid honey exposed at nearly 100 per cent relative humidity increased an average of 1.08 per cent per day for 20 days. In a period of less than three months this sample increased 84.4 per cent in weight, at which time it contained 55.2 per cent water. In all samples the rate of water exchange became progressively slower as a point of equilibrium between air moisture and honey moisture came closer.

Honey samples lost water in low humidities at a much slower rate than they gained water in high humidities probably because a shiny dry film which formed on the surface of the honey retarded water exchange. Cappings on honey cells do not prevent gain or loss of moisture. Water passes through cappings readily. Of the two chief sugars of honey, dextrose was slightly hygroscopic and levulose highly hygroscopic. Levulose contributes most to the hygroscopic properties of honey. Crystallized honey samples lost or gained moisture a little more slowly than liquid honey samples.

Tests similar to the above were run to determine several points of equilibrium between water content of honey and relative humidity of the air. These points are shown in Table 1. They may serve to give beekeepers and honey packers a better insight into the behavior of honey at different humidities and also be of value in research work relating to nectar ripening or honey storage. An example may help to interpret Table 1. If we assume that a container of honey of 18 per cent water content were placed in a relative humidity of 81 per cent the honey would absorb water up to a water content of 33.9 per cent and at that point there would be a balance between the air and the honey. At 76 per cent relative humidity the water content of the honey would come to balance at 28.9 per cent. Water is of course gained or lost at the surface of honey and diffusion from below the surface is slow.

Table 1

Approximate equilibrium points between the relative humidity of the air and the percentage water content of liquid clover honey at 68 degrees F.

Relative humidity	Water content of honey
52	16.1
58	17.4
66	21.5
76	28.9
81	33.9

Absorbed Water Slowly Diffuses Downward

In one series of tests honey was exposed in humidity chambers in beeswax containers so that samples of honey could be removed from any desired depth by piercing a hole in the container wall. The holes were re-sealed with a wax plug and a hot knife. It was interesting to note that in high humidities the water content at the surface became quite high but the high moisture moved

down into the sample quite slowly. For example one sample of honey was exposed in a relative humidity close to 100 per cent. It took three weeks before the water content began to increase 2 cms below the surface and 12 weeks before an increased water content reached 6 cms below the surface. This indicates that if a tank full of honey is left exposed for a few days in a high humidity only a shallow surface layer will increase in water content and the tank may be almost emptied before honey of high water content is encountered. However, when a large surface of honey is exposed to high humidity as is the case when honey is still in the comb the total water absorption can be quite great and the extracted product of high water content.

Controlling Water Content

The statement is often heard that a certain plant gives honey of good body. Honey from any plant can be of good body if the bees or the beekeeper ripen it. Fall honey is usually of high water content because the humidity is often high and the bees cluster on cold nights and can not carry on as efficient ripening work as they can in warmer weather. The bad reputation of aster honey for wintering may be partly due to the fact that it is gathered too late in the fall to be properly ripened.

By faulty management a beekeeper may increase the water content of honey after the bees have spent much time and effort ripening it. For instance leaving honey above bee escapes for three or four wet days may increase the water content considerably thereby lowering the grade and increasing the danger of fermentation. If supers of honey are removed from the hives and left for several days or even weeks before extracting the honey will become very watery if the humidity is high. Thus any exposure of honey to high humidities, particularly before it is extracted from the combs will lead to water absorption.

A beekeeper can also influence water content of honey by his method of supering. Colonies which are kept slightly crowded for super space so that the combs become well filled and capped generally yield lower water-content honey than where the bees have excess super space. The beekeeper who provides plenty of super space in the interest of colony morale and swarm control can easily rectify high water content of his honey by using a drying room in his honey house. High water content certainly does not have to be a problem with any beekeeper nowadays. Killion (1950) described an air-conditioning unit used successfully in his honey house. Townsend and Burke (1952) described several drying rooms used successfully by beekeepers. It is of interest that the relative humidity in a drying room does not have to be extremely low. As a matter of fact in tests previously referred to, water absorption from honey samples was somewhat higher at 20, 32, and 42 per cent relative humidity than at 0 per cent relative humidity. This would indicate that air of up to 42 per cent relative humidity circulated through supers in a drying room could remove moisture efficiently from normal honey. The lower drying efficiency of very dry air is again likely a situation where the rapid formation of a shiny, dry film on the surface of the honey retards loss of water from below the surface.

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"For your information, that soap box you borrowed to make that racer is a hive and that hum you hear isn't your motor!"

Sigmund A. Lavine, author of "Wonders of the Hive" in his library.

A New Book "WONDERS OF THE HIVE"

SIGMUND A. LAVINE has written a beautiful book about bees entitled "Wonders of the Hive". Relying on his own first-hand experience with bees and on careful scientific consultation, Mr. Lavine has succeeded in making the activities of these amazing insects highly interesting and entertaining. He runs the range of all types of bees from the solitary bees, through the carpenter, mason, mining, social and stingless bees, and the helpful honeybee. The book holds your interest from cover to cover with its bright, clear illustrations and its interesting commentary on the world of nature.

After reading his book and enjoying it very much, we wrote Mr. Lavine to find out just how he happened to write a book on bees, and this is the answer we received:

"I started with bees by a fluke — I spend my summers in Sanbornton, New Hampshire and the local church asked me to serve as auctioneer—you know—one of those auctions where everyone brings their junk and buys the other chap's because "it is a good cause". I couldn't get a bid on a hive with frames and two supers so I rashly started it at a quarter—and had to buy it! That was my start. I really haven't had any great success—my bees have been in a small clearing in the deep woods and suffer from lack of feeding range. In fact, this year I've moved them to a neighbor's pasture and now have great hopes. Incidentally, I moved them three miles with nothing but a burlap bag stuffed in the entrance—they have been examined so many times that they are the most gentle bees in the world."

The "Wonders of the Hive" is published by Dodd, Mead & Company, New York City, New York.

W. A. Stephen shows a brood comb to beekeepers.

For the Beginners And the Begun

W. A. STEPHEN
N. C. State College
Raleigh, N. C.

DID YOU EVER consider that being human is a disadvantage? It certainly is when we try to understand bees. We humans have had to go through the stage of growing up. We pass from babyhood to childhood to adolescents to adults, but the bee, when we recognize it as such, is already grown up. As an adult, the bee is somewhat like a storage battery which, if used a great deal, has a much shorter life than if it lies around and is unused. Thus, "summer bees" only last six weeks whereas "winter bees" may live six months.

I remember that in one of my school books was a picture of a little boy hopping around on one leg and holding one hand as if in distress. Underneath it said, in part, "Bees don't care about the snow, I can tell you why that's so. Once I caught a little bee that was much too warm for me." Now you know better than that! As you read and study about these curious insects you will learn how bees stay warm in winter and, too, how they air-condition their hives in summer to keep cool. We say the bees do these things by instinct, because we are humans and we can't give a better explanation.

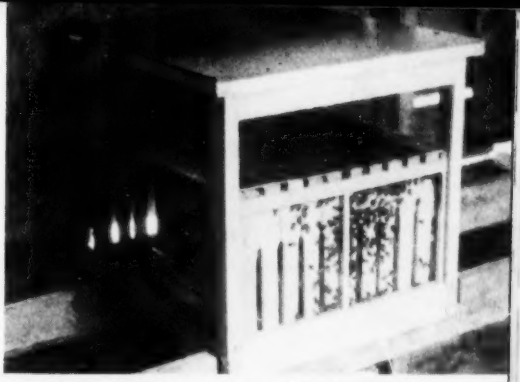
Nature has given us many things which we can enjoy. Some of them we enjoy more than others. For instance,

we may enjoy sunshine more than rain, or heat more than cold, or play more than work. But, if it weren't for the rain we wouldn't have the beautiful crops and nice green lawns; if it were not for cold weather we wouldn't have the brilliant snow or ice on which to skate; and if it weren't for work we shouldn't enjoy the time that we take out to play. The list of Nature's gifts is endless. Unfortunately, the customs that have grown up around keep us from enjoying many of these pleasures. For instance, since man has taken to living crowded together in cities and towns, many of us miss the songs of the birds and the hum of the bees which are sounds well known in the country. Today we may drive many country miles without even seeing a horse. Such is the price we pay for progress.

One way to enjoy the pleasures that were familiar to our fathers, grandfathers, and indeed to our ever-so-great-grandfathers is to keep a hive of bees right at home. I know that someone is going to interrupt me and say, "Well, what if the bees sting the folks around the house"? Let me answer right now that it is possible to get bees to keep in the backyard that will not interfere with humans. While the keeping of bees in the backyard is a custom as old as the hills, being able to keep them there without the danger of someone getting stung is very new.

There is another reason for having gentle bees. As a beginner you need bees that you can handle easily. You need to be able to look into the hive frequently to see what is going on. It is a real thrill to see a young bee cut her way out of the cell. Remember, although young, she is an adult; and for this young bee one day of her life is equal to about two years of yours. It is a real experience to see the queen back into the cell to lay an egg while her attendants form a circle around her with their heads pointing inward. These are things that many "old timey" beekeepers have never seen.

If certain of my friends happen to read this, I can hear them warning not to look into your hives too often, that it is not good for them and that it disturbs them in their work. There is no scientific basis for this statement, however, and if necessary, we could present evidence to show that colonies examined once a week through most of the



Glass hive in the house of G. J. Hedrick, Cherokee County, North Carolina.

build up and nectar gathering periods produce more honey than colonies not looked into.

I hope that the thrill of observation, insatiable curiosity and the quest for information will continue to possess you as long as you keep bees. Let me make a confession on the part of those who are supposed to know. We do not know all the answers. Of the thousands of books that have been written, more questions have been left unanswered or answered only in part or answered wrongly than have been answered satisfactorily. When one is young or is beginning with bees is the time to make observations. The commercial beekeeper is too busy to observe the wonders of Nature which you may see unfolding in your own hive.

I haven't said anything yet about the thrill that you will get as the thousands of little workers visit the tens of thousands of flowers and bring back the tiny drops of nectar which they make over into honey and store in their newly made cells as liquid gold. When the honey is finally ripened and sealed and it joins the biscuits for a delicious repast, this is a particular thrill that only the beginning beekeeper can experience.

Don't let the fear of stings spoil your venture. Of course, it is foolish not to take precautions at first, so that you will need the customary veil and, probably, gloves and, of course, you should always have a bee smoker. But, first of all, anticipate all the pleasures that you will have in working along with these creatures of Nature. Even if you have bees now, take time out to make some observations. You may not discover anything new, but you will have fun. As a human, you can enjoy learning how, and perhaps why, bees behave as they do.

NEWS REEL

A. R. Dean, President of the Pennsylvania State Beekeepers' Association, presents a $10 scholarship award to FFA member David Ebersole of Middletown, RD 1, Dauphin County, and to David Lapp, 4-H member from Bareville in Lancaster County. Awards were a feature of the annual beekeeping short course at the Pennsylvania State University, arranged by E. J. Anderson, Prof. of Beekeeping, right.—Photo by V. Horn.

The Government of Mexico, in co-operation with the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Organization of American States (OAS) set up at Patzcuaro the Central American Regional Fundamental Education Training Centre (CREFAL). This has continued with the co-operation of specialists provided by UNESCO, the International Labor Organiza- (ILO), the Food and Agriculture Organization (FAO), the World Health Organization (WHO) and the United Nations Technical Assistance Administration (TAA).

FAO expert, Mr. S. E. ANTUNA, of Uruguay, examining one of the old type bee hives with two of his students. — United Nations photo.

Photograph shows Betty and Leslie Floyd attending the Honey Booth sponsored by the American Beekeeping Federation and National Honey Packers and Dealers Association with American Honey Institute cooperating and Honey Industry Council acting as supervisor and coordinator at the National Home Economics Convention in Philadelphia, Pennsylvania, June 24 through June 27, 1958.

This window display put up by Thomas Doonan, 8924 Buena Vista Court, Des Moines 10, Iowa, won first premium at the Iowa State Fair. He also won premiums for other entries such as creamed honey, beeswax, frame of cut comb, and observation hive.

DOONAN
HONEY FARMS
Des Moines, Iowa

B & Z Library

Editorials

Let Bees Alone During Late Fall

IT HAS BEEN SAID that man is the bees' worst enemy. There appears to be some truth in this statement. For thousands of years honeybees have lived and increased their kind on this planet. Honeybees do actually get on quite well in their natural habitats when they are left strictly alone. When man decides to remove a swarm of bees from a bee tree and put it into a modern movable frame hive, he may or may not be successful in having that swarm continue life in the new environment and to gather enough honey and pollen for food requirements throughout the year, not to mention surplus honey which rightly belongs to the owner of the bees.

Obviously, the degree of success attained by the owner of the bees depends on his knowledge of bee behavior and the principles that govern success.

It is said that more bees die of starvation during the winter and early spring months than from any other single cause. This loss is due to the owner of the bees not leaving enough honey and pollen in the hives for the bees during the season of the year when nectar and pollen are not available from natural sources.

During the war years when honey brought a high price there was a temptation to rob bees too closely in order to secure more honey to sell. Many beekeepers gave way to this temptation and consequently lost their bees during the winter. At present, when the demand for honey is not so strong, beekeepers should leave more honey for winter stores.

If beekeepers would leave an adequate amount of honey and pollen with each colony every fall, between 50 and 60 pounds as a minimum, and would winter nothing but populous colonies, furnishing adequate protection from the elements, these beekeepers would have colonies of bees in the spring, barring unusual adverse weather conditions.

Some beekeepers make a practice of exchanging combs in the brood chambers during the late fall months. When this is done the arrangement that the bees have, of forming their winter brood nest, is interfered with and may result in the loss of colonies.

One reason why some backlot beekeepers who never look at their bees during the late summer and fall months, after the surplus honey is removed, have comparatively few losses is that these colonies have time during the late summer and fall months to stock the brood chambers with honey and pollen and to arrange the brood nest to their liking. We will have to admit that the bees know more about fixing up their brood nest for winter than the owner of the bees does.

During November it is a poor policy to manipulate colonies of bees to remove combs unless it is necessary to exchange empty combs for full combs of

honey. Bees should be left strictly alone during late fall months, assuming that each colony is well provided with stores and is of adequate strength to go into winter quarters.

It should be said that bees that are short on stores can be fed thick sugar syrup during November. The syrup should be fed warm, in friction-top pails with lids perforated with small holes, the pails inverted over the top bars of the frames.

U. S. Estimated Honey Production for 1958

The following is taken from the U. S. Department of Agriculture Crop Reporting Board, Washington, D. C., as of October 9, 1958.

THE 1958 HONEY CROP is now estimated at 252,134,000 pounds — four per cent more than last year's crop, according to the Crop Reporting Board. This year's crop is being produced by 5,401,000 colonies of bees, compared with 5,396,000 colonies of bees last year. Honey production per colony averaged 46.7 pounds, compared with 44.8 pounds in 1957 and the 1952-56 average of 43.5 pounds. In mid-September, beekeepers had about 108 million pounds of honey on hand for sale — about 43 per cent of the estimated 1958 production.

Honey production is well above last year in the West, West North Central and South Central States. Increases from last year were 22 per cent in the West, 18 per cent in the West North Central and 16 per cent in the South Central States. These were partially offset by decreases of 20 per cent in the North Atlantic States, 18 per cent in the East North Central and 14 per cent in the South Atlantic States. In the West North Central States honey production was above average. Minnesota had favorable weather and a large crop of high quality honey was produced. The season was also favorable in North and South Dakota, Nebraska, Missouri, and Kansas. In Iowa, wet weather cut the main clover flow. Production in the South Central States was above average with Texas producing the largest crop since 1950. Production in California was the highest since 1952.

The 10 leading honey States which produced 61 per cent of the crop are: California, Minnesota, Florida, Wisconsin, Texas, Idaho, Iowa, New York, Michigan, and Arizona.

Beeswax for Grafting Fruit Trees

THE VERY CONVINCING article, page 654, by R. E. Nieman, recalls the fact that the late Elmer Hunt of Lansing, Michigan, for years sold a special grafting wax in which beeswax was one of the ingredients. Since micro-crystalline mineral waxes have often replaced beeswax for insulating and water-proofing it is gratifying to find such substantial evidence of the superiority of beeswax over other waxes for grafting. The soothing, healing properties of beeswax are so well known that it is easy to believe the conclusions of one who has made such unbiased and exhaustive tests. Think of a fruit tree bearing many kinds of fruit. But read and be convinced!

U. S. Honey Displayed at Munich Fair

A RELEASE from U. S. Department of Agriculture dated September 30, 1958, mentions the U. S. foods on display at the German International Food Fair held September 25 to October 5, in Munich. This fair presents exhibits of 44 nations and more than 1400 individual exhibitors. It is gratifying to know that United States honey was on display among the foods in our exhibit. This should help to increase the export demand for our honey.

Pope Pius XII

POPE PIUS XII was a keen student of the natural history of the bee colony and often referred to the bees' industry and to their proof of Divine Planning. It is interesting that in one of his last public addresses before his death on October 8, he alluded again to the bees (see page 683).

B & Z Library

FROM Foreign LANDS

Translated and Edited by ERIKA BARTH, San Antonio, Texas

Beware of Catching Stray Swarms:

A BELGIAN Bee Journal warns not to catch stray swarms of unknown origin. The reporter knows of three cases to date where mites were brought into apiaries in this way. He also believes catching these swarms is senseless because it is against all principles of breeding and selection. One is almost intentionally breeding swarm-happy bees.

If one still cannot resist catching a nice large swarm, one must treat the swarm **at once** for mites, not a day later. If possible, replace the queen with one who's progeny shows little tendency to swarm.

Gleanings' readers in the United States and Canada should also be alert to the possibility of picking up American foulbrood in stray swarms. This is a serious danger that can be eliminated if the stray swarm is hived on new foundation rather than drawn combs. However, the chance of improving the honey-gathering qualities in your apiary is not possible with stray swarms whose background is unknown.

La Belgique apicole, Aug.-Sep., 1957.

Are We Going Up— Or Downhill? ?

A FRENCH beekeeper (R. Borneck) is looking for reasons for the momentary crisis in beekeeping and asking about hopes we can still have and what we can do to get ourselves out of this bad situation.

Beekeepers as a rule are very individualistic. Business methods should be modernized, equipment more standardized. Scientific experiments should be better organized, and scientists should cooperate. Breeding can only be improved upon by long, patient and often costly experiments with new races and crossings. Progress comes to us here again from U.S.A.

Practical help for beekeeping comes to us from Russian state-owned farms. There, cultivated plants are also very valuable honey plants. Planting is staggered in such a way that bees constantly have a source of nectar.

We have to work closely with our scientists, even when new methods are not immediately turned into monetary gains.

Some beekeepers believe that our bee journals are too technical and do not appeal to the little man. They would like to lower the standards of quality of our journals which in many cases is too low already. New progress reports encourage to adapt progressive methods. We definitely need more solid, substantial articles and less long-winded repeats!

Even very technical articles can be printed in our journals, if they are explained in generally understood language, and are accompanied by advice to put the knowledge gained into practical usage.

Revue francaise d'Apiculture, July, 1957.

Save That Beeswax:

BEESWAX IS valuable but how many beekeepers take enough care with its conservation and refining, reports C. D. Ilton, Senior Apiary Inspector of Victoria, Australia. He has often seen burr comb which has been scraped from hives left on the ground in front of the hive and never gathered up Throwing old broken combs into the bush around the apiary is common, while on many occasions stacks of old combs are left to the ravages of the

(Continued on page 679)

Honey Baked Beans and Honey Brown Bread. — Photo courtesy Kellogg Co.

When Wintry Winds Blow

MRS. BENJ. NIELSEN
Aurora, Nebraska

AREN'T OVEN DINNERS the most? Long slow cooking, allowing the flavors to mingle and merge into glorious perfection. Controlled even temperatures that permit the cook to go about household duties, curl up with a good book, or watch her favorite TV program, snug in the assurance of a super meal for hungry homecomers.

If you are a bit Scotch why not just fill all the oven space with same temperature foods you can hold over or freeze? Slide a sheet of honey cookies in too. Now is the time for some honey baked apples along with the beans and bread. Select even-size baking apples (we prefer Johnathan) wash, core, and place in baking dish. Fill cavities with raisins or crushed pineapple, drizzle liberally with honey, a generous dollop of butter and a dash of cinnamon. Pour in about one-half cup fruit juice, pineapple, apricot nectar, etc. Slide into oven to bake until apples are tender. Um!

Honey Baked Beans

Two cups navy beans, dried, 3 cups water, 1½ teaspoons salt, ¼ cup honey, ¼ cup brown sugar, ½ teaspoon dry mustard, ½ pound salt pork, and 1 medium-size onion.

Wash beans, cover with cold water and soak overnight. Drain off water, place beans in large kettle. Cover with water. Cook slowly until skins burst. Drain. Save liquid. Combine salt, hon-

(Continued on page 687)

Research Review

By DR. ROGER A. MORSE

Research Editor of Gleanings and Ass't. Prof. of Apiculture Cornell Univ., Ithaca, N. Y.

A Review of Royal Jelly Facts:

THE AUTHOR states "It would be both unfair and unscientific to deny categorically a possible value for royal jelly in human therapy." Earlier in his paper he states that there exists "no substantial body of evidence in support of beneficial effects in human therapy".

Elsewhere Dr. Shuel discusses what royal jelly is, and of special interest are some notes on the claims made for royal jelly. It is pointed out that proof is lacking in these cases.

In conclusion mention is made of current research and the fact that a report on a study of leukemia in mice will be released shortly. Dr. Shuel states, however, that in current studies royal jelly is used in amounts much greater than the 50 milligrams frequently found in capsules on the market.

Shuel, R. W.
Royal jelly—facts and fancies. Canadian Bee Journal. July-August 7-10. 1958.

The Attractiveness of Plants to Bees:

ON THE BASIS of feeding experiments a short while ago a researcher suggested that certain mixtures of the various sugars found in nectar were more attractive than other combinations. The paper cited below comes to the conclusion that sweet clover is more attractive to bees than three other plants under investigation. Further, sweet clover contains sucrose, glucose and fructose in approximately equal proportions which was in agreement with the earlier work.

The authors remark, as have several others, about the variation of nectar from plant to plant and from crop to crop. This latter indicates that the study of nectar and nectar secretion will remain a fertile field for some time.

Furgala, B., T. A. Gochnauer and F. G. Holdaway. Constituent sugars of some northern legume nectars. Bee World 39: 203-5. 1958.

Extension Marketing Handbook on Honey:

THIS HANDBOOK is part of a series of over 60 designed to provide general information about the sundry subjects. Data on honey consumption, kinds and sources, grading, costs, production etc. for the United States for the past few years are given. A bibliography citing source material is attached.

Miller, Harold W. and Betty Woods.
Honey. Extension Food Marketing Handbook. Cooperative Extension Service. Cornell University and U.S.D.A. p. 11, 1957.

Disease in Wild Colonies:

DR. BAILEY OF the Rothamsted Experiment Station (England) recently published information about the incidence of disease in wild colonies of honey bees. It has long been thought by some that wild colonies harbored a great deal of disease and these should be sought out and destroyed. Other people have projected the thought that wild colonies harbor little disease and are little or no menace to beekeeping.

A request for such information was made of beekeepers through the Bee

(Continued on page 683)

Live and Learn

by Propolis Pete

AGAIN THE TIME has come for me to air my annual gripe about the contrariness of my bees in their search for nectar. Generally there is a simple answer to the most perplexing question, and probably there is to this one, but it gets me just the same.

The puzzle concerns nectar secretion. Why is it that there will be a patch or a field of flowers, with every conceivable kind of bug working the blossoms, excepting honeybees? In front of my colonies there is a patch of overgrown land about 100 feet square. I leave it unmowed because the plants will grow to a height of four or five feet, thereby partly screening the yard from the road, and at the same time provide some nectar—I hope. Generally it grows into goldenrod, and when it blooms around the end of September, as it is doing as I write this, it is covered by flies, solitary bees and wasps, but no honeybees. There must be loads of nectar in those blossoms, for the insects that are on them are not there for fun. The bees could walk to work, but they don't.

At the same time, up on the road near my mailbox, there is a patch of about half an acre that used to be the kitchen garden of a farm house, when the place was being used. This garden has a lot of the little white asters, and is prettily bordered by a fringe of dwarf toad flax. Butter-and-eggs is the common name for it, and I have never seen bees work it for anything. Today while I was waiting for the mailman to drive by, I was snooping around up there. There were two shifts of bees working, one on the asters and the other on the toad flax. Each shift went about its own business, not paying any attention to the alternate flower, only maybe a foot away.

Aha, you say. That is the simple answer. The bees were getting so much more nectar from them than from the goldenrod, that they were saving the goldenrod for later. Tain't so, for in back of this same farmhouse is a patch of the same goldenrod no bigger than the one in front of the hives, and it was humming with bees. I can understand that the scouts had reported the second patch of goldenrod and had not reported the stuff close at hand, but the dumb idiots were flying right over my patch, not more than four feet above it. Surely they must have seen it.

This isn't the first time that I have noticed that bees seem to prefer to fly to a distant source rather than a close one. Maybe they haven't the right word for a few feet when they report, although they seem to do all right when it comes to sniffing out a drop of honey in front of a nearby hive. Another instance of this was embarrassing some years back. The bees would go to the neighbors for water, and make things uncomfortable for their animals. I invented a dozen or more different kinds of waterers that I set down in the midst of the colonies, but the bees ignored them by the thousands. They even went down my well rather than use them. Sometimes when I would work the handle, a small swarm would fly out of the pump.

I was about licked on that problem, when my Mrs. decided that she wanted a lily pond. So we made a cement tank about 10 by 12 feet, and put in water lilies, goldfish and pollywogs. The bees love it, but the important thing is that it is about 200 feet from the hives, and now we have the thirsty bees instead of the neighbors having them.

As I said above, there is a simple answer to all this. What it is, I don't know, and, after all, it isn't very important. The important thing is that the bees do go out and bring back nectar and it doesn't matter whether they get it 10 feet away or a quarter of a mile away. Maybe it is just another case of contrary femininity, or as Andrew H. Brown used to say, "a woman's ignition".

Here's the latest on my dead brood problem. I still don't know what it is, for I haven't got the report yet. But another colony developed the same symptoms. I requeened with some of that high priced hybrid stock that you see advertised, and the trouble disappeared. Whether it is just a coincidence, I won't know until next year. It could be that the stock is running out from too much inbreeding. I only requeen when necessary, and maybe now is the time.

Golden crown beard (Verbesina encelioides).

Let's Talk About HONEY PLANTS

HARVEY B. LOVELL
University of Louisville
Louisville, Kentucky

Stickweed. According to a recent letter from John Amos, Extension Entomologist at Virginia Polytechnic Institute, the name stickweed is used to denote a species of crownbeard (**Verbesina occidentalis**) in Virginia rather than wingstem (**Actinomeris alternifolia**). Actually the two species belong to closely related genera, so close that H. A. Gleason in the 1952 edition of Britton and Brown, place them both in the genus **Verbesina.** Mr. Amos enclosed an extension circular in which it was reportthat wingstem was harder to kill with 2, 4-D than stickweed.

He adds, "Both plants are attractive to bees. At one place in Tennessee a beekeeper told me that he often made a super of honey in August from wingstem. Here in Virginia where crownbeard (stickweed) used to be abundant, beekeepers reported that they formerly harvested more honey in the fall than in the spring, but such has not been the case in recent years. It may be due to the weather, but more probably to the reduction of the honey plant area." The increased use of weed killers is particularly hard on the fall crop of honey since most of it comes from such weedy plants as asters, goldenrods, crownbeards, wingstem, wild cucumber, and Spanish needles.

Golden crownbeard (**Verbesina encelioides**), a common species in the middle west and southwest from Kansas to Montana and southward into Mexico, is of considerable value to bee-

keeping in several states, particularly Texas (see photograph). H. B. Parks described the honey as amber and rather strong in flavor. Virginia crownbeard (**V. virginica**), a white-flowered species with small clusters of flowers is a valuable species in Kentucky. It grows along shaded roadsides and in open woods especially in the eastern part of the state.

Franklinia. Mr. Louis G. Jenkins of Wyoming, Delaware, writes to inquire about the value of this rare shrub for bee pasture. This is Bartram's lost tree. John Bartram collected a specimen of this plant along the Altamaha River near the present Fort Barrington in Georgia, and transplanted it to his garden in Philadelphia some 150 years ago. No one has ever found it growing wild in nature since. Luckily Mr. Bartram gave cuttings of Franklinia to several other botanists, and it has thrived in cultivation. Many botanists have searched the general area where Bartram reported that he collected it, but no one has been successful in relocating this unusual shrub. It blooms in late summer with attractive white flowers three inches across and is hardy as far north as Massachusetts. There is an excellent photograph of a blossom opposite page 215 in GREEN LAURELS by Donald Culross Peattie.

Elaeagnus. W. A. Stephen, Extension Beekeeper from North Carolina, writes me that he "brought in a sample of honey plant on July 16 that has been identified as silverberry (**Elaeagnus umbellata**). This is quite a large tree that has probably been set out at some time as an ornamental. It is a fairly large tree obviously different from oleaster (**Elaeagnus angustifolia**). It does not appear to have been included in any list of honey plants which I have seen, but it is reported to be worked very heavily by honeybees early in the summer. The specimen which I saw was from McDowell County in the foothills of the North Carolina Mountains." L. H. Pammel speaks highly of oleaster as a honey plant (**A.B.J.** November 1917). According to Pellett (**American Honey Plants,** 1947, p. 446) still another species, Wolf Willow (**E. argentea**), is of special importance to beekeepers in the prairie provinces of western Canada.

Blueberries. Herbert Zobrist of Seattle, Washington, writes to inquire about the occurrence of blueberries in his state. Leroy Abrams in his **Illustrated Flora of the Pacific States** lists nine species of **Vaccinium** (blueberries or bilberries), most of which occur either on the coast or in the mountains of Washington State. Two of these, the dwarf bilberry or blueberry (**V. caespitosum**) and the bog bilbery (**V. uliginosum**), are plants with which I am familiar in the mountains of New England, where they secrete nectar copiously. Since the flowers of this genus have a large nectary on top of the ovary surrounding the base of the style, I am confident that all nine species produce nectar under average conditions. However, I can find no reports of blueberry honey from the Pacific northwest. Anyone with knowledge of honey from blueberries please write. Considerable honey is made from blueberries in Maine nearly every summer as I have mentioned in this column previously.

NEWS FROM FOREIGN LANDS

(Continued from page 674)

wax moth. Some beekeepers even do not save "slum-gum" from the wax press and occasionally pure cappings have been known to be discarded.

This is all valuable material and is easily reclaimed. "Slumgum" from the reducer although dark in appearance may contain as much as 10 per cent beeswax. If time and facilities are not available for the treatment of this material it may be forwarded to commercial beeswax refiners.

Again, the poor conditions in which some beeswax is forwarded to refiners is amazing. I recently saw a consignment of beeswax that was sent to a refiner. This was in cut down honey tins which contained about one part of beeswax to two parts of honey.

The Australasian Beekeeper, Feb. 15, 1958.

Our Cover

WHILE NO HIVES of bees are in sight we dare say there are some nearby that collected pollen from this corn. The fleecy clouds and blue sky have the appearance of cold weather ahead.—Photo by John Buchanan of The A. I. Root Co.

Fig. 1. The five earthen cellars of Fischer and Kauk are in a row. The excavated earth raises the ground level above the surrounding fields.

Most of the bees overwintered in North Dakota are kept outside with 44 beekeepers packing more than 2,800 colonies, with an anticipated loss of five per cent. There are four beekeepers who winter about 650 hives in cellars. These beekeepers were interviewed and information on their operations as well as their comments follow:

Cellar Wintering

RICHARD L. POST[1] and HOWARD R. CREE[2]

AT THE REQUEST of Mr. Deyell, Editor of Gleanings, we obtained information on cellar wintering of bees in North Dakota. The results were so interesting that we decided to submit a short article on this subject.

Fischer and Kauk, Grand Forks

E. V. Fischer and C. W. Kauk pool their resources for wintering. Approximately 450 colonies are wintered at Kelly Siding near Emerado where they have a total of six bee cellars.

Earthen Cellars

Five of the cellars, shown in Fig. 1, are earthen cellars which hold 75 colonies each. Four of these are hand-dug cellars constructed in 1927 and 1928 by E. H. A. Fischer. The fifth was dug mostly by machine in 1947 by E. V. Fischer and C. W. Kauk, son and nephew respectively of E. H. A. Fischer. The older cellars are still in excellent condition after more than 30 years of

[1]Associate Entomologist, North Dakota Agricultural Experiment Station, Fargo, N. D.
[2]Deputy Bee Inspector, North Dakota Department of Agriculture & Labor, Bismarck, N. D.

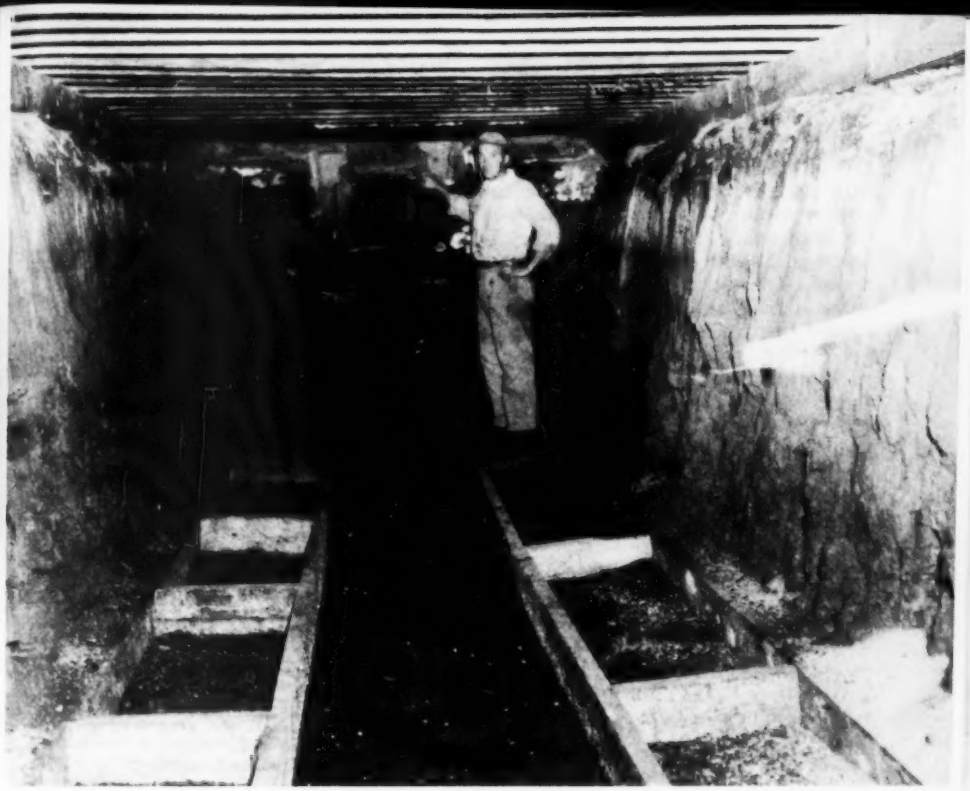


Fig. 2. Interior of earthen cellar. Mr. Kauk is pointing to ventilator.

use. The original shovel marks are still plain to see and there has been practically no disintegration of the walls.

The colonies rest upon 2 x 6 inch wooden frames which keep them off the floor and give the bees room to carry out their dead. Sometimes there are up to 2½ inches of dead bees piled up in front of the reduced entrances.

The cellar height is 6½ feet with the floor being 5 feet below ground level. The soil from the excavations was piled around the cellar to provide drainage. There is a ventilator at each end with one in the top half of the door. Above the ceiling is a foot of insulation consisting of alternating two inch layers of soil and flax straw. Extreme temperature variations of more than five days duration are required before it is necessary to regulate the ventilators. The cellars maintain a temperature of 45 degrees F. during the winter. The door is made in two sections with straw piled in front of it. To enter and check the colonies, one has to pull away a forkful of straw and enter through the top section of the door. The interior of an earthen cellar is shown in Fig. 2.

Concrete Walls

The sixth cellar is beneath the honey house which includes the extracting equipment, garage and large storeroom. This cellar with plastered concrete walls, built by E. H. A. Fischer in 1927, holds 100 colonies. There are three ventilators in this cellar, one at each end and a trap-door type in the center. Mr. Kauk (Fig. 3) is pointing to two sections of a ventilator shaft. The upper ventilator is set for winter and requires adjusting only during protracted periods of extreme temperatures. The one at the floor line is used to bring in air to cool the floor when it gets too warm in the spring. The one shown in the center (see arrow) is used only in late spring if it gets too warm before the bees are taken outside. Note the homemade "stretcher" for carrying colonies. They are brought in one at a time in the fall and frequently removed two at a time in the spring when they are lighter.

Winter Loss

The average winter loss is five per cent in these bee cellars. In good years with an open fall and a chance to requeen, there is as low as one to two per cent loss. The worst year was 1950 when a 50 per cent loss was experienced. That spring there was rain and snow until May 20 and it was June 1 before the roads were open enough to get the bees out. Dysentery accounted for 90 per cent of the loss. Last winter there was a loss of eight per cent; it was an abnormally warm winter and the bees were removed by March 25, about two weeks earlier than usual. The higher than normal loss in 1957-58 was probably due to excessive brood rearing and subsequent starvation. Abnormally warm weather with highs of 65 degrees in Febuary probably stimulated brood rearing.

Food Chamber

Fischer and Kauk use two standard hive bodies (food chamber) with stores of 60 pounds of honey. This way the bees go through the winter with ample stores and do not require supplemental spring feeding. The colonies are stored two high. Entrance blocks are left in and adjusted to the wide opening. The telescope cover is lifted up with the rim of the cover setting on the top edge of the inner cover which permits moisture to be expelled through the bee escape hole. Mr. Kauk reports that, "We have also tried one and three hive bodies with the best results from two. With one, the bees were inclined to starve. When three hive bodies were employed, they didn't seem to expel moisture".

Cellar Versus Package Bees

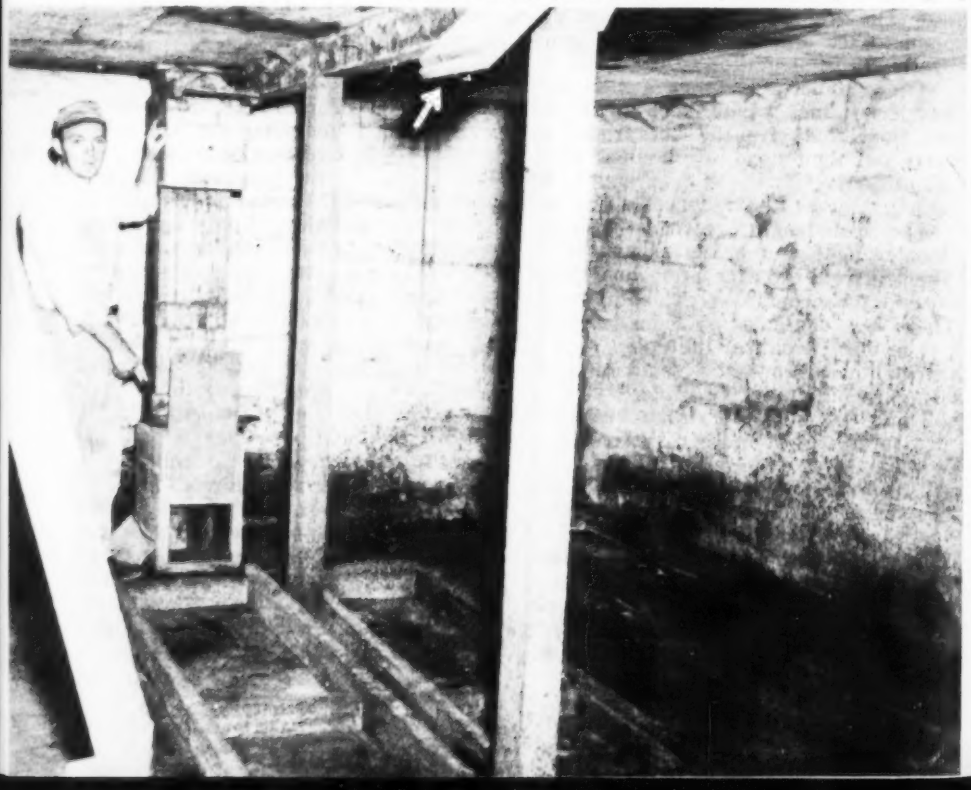
Mr. Kauk has kept production records on bees kept in cellars as compared to package bees on drawn combs. The average yields per colony for the past two years are as follows:

1957	
Cellar	120 pounds per colony
Package	79 pounds per colony
1958	
Cellar	160 pounds per colony
Package	95 pounds per colony

If readers of Gleanings are interested in constructing bee cellars, Mr. Kauk will furnish detailed specifications and illustrations in a future issue.

(Continued on page 696)

Fig. 3. Interior of plastered concrete cellar beneath honey house. Center ventilator (indicated by arrow) is used only in late spring.



Beekeepers Talk to the Pope

A brief summary of the talk Pope Pius XII gave to the beekeepers of the World's Congress, just before his death, October 9, will appear in the December issue of Gleanings.

JAMES I. HAMBLETON

THE HIGHLIGHT and the unusual feature of the Congress, to me, at least, was the audience which the Pope held for the beekeepers. Early one morning we took busses to the Pope's summer residence, some miles out of Rome. After checking our cameras we were ushered into a large waiting room which was rather bare of decorations except for a golden chair placed on a dias covered with scarlet cloth. With out any fanfare of any kind the Pope entered, waved to the group and took his seat. After a few words of salutation he read in French a half hour long paper on bee culture, covering the subject very thoroughly and ended with the usefulness of bees as pollinators.

As a representative of the U. S. beekeepers I was privileged to sit on the front row. When the Pope concluded his paper, which was delivered in a clear strong voice I was one of the first to be introduced to him. We shook hands and in excellent English he told me how glad he was that I had come to Rome and would I please convey his best wishes and blessing to the beekeepers and people of the United States. In turn I thanked him for the rare honor of meeting him and complimented him on his fine appearance and vigor. I have a good photo of the greeting taken by the official photographer of the Vatican.

The whole affair was a revelation to me. It was completely free of all ostentation and pomp. No meeting could have been more democratic or friendly.

The Italian beekeepers presented the Pope with a silver skep.

After the Pope said goodbye and we all applauded we visited his apiary and fruit garden. It seems that the Pope is very fond of honey and is genuinely interested in bees. Also took pictures of the apiary and extensive and beautiful gardens.

RESEARCH REVIEW

(Continued from page 676)

Research Association and beekeepers from several parts of the world replied where they had specific data. Though not a great deal of information was forthcoming the general conclusion was that there was less disease in wild colonies than there was in the average apiary.

In searching for reasons for this it is known the combs of weak colonies or colonies which have died from disease are soon destoyed by wax moth in most parts of he world. Further, beekeepers have their colonies closer together than they would be in the wild and this makes the transmission of disease from one colony to another much easier.

It is known that European foulbrood infections decrease during honey flows and the author states he has data to indicate the same is true of Acarine disease. Other authors have made similar statements about American foulbrood. It is also known that overpopulation reduces the amount of forage available to bees and therefore retards normal growth. When growth and expansion within the colony are not normal it might very well be that they are more susceptible to disease.

It is unfortunate that more beekeepers did not respond to the request for information. Nevertheless Dr. Bailey's presentation of the material is very good and obviously reasonable.

Bailey, L.
Wild honey bees and disease. Bee World. 39: 92-5. 1958.

THEY ARE GONE THE GOLDEN ONES

Some people remember best to travel back along the avenues of sight. For them life-pictures come up before their mental vision, clearer by far than photographic plates; true, vivid as a garden still splashed with rain after a shower at sunset-time.

JESSIE HATTER ANDERSON
Liberty, Kentucky

IN OUR BUSY, workaday lives sometimes one of these pictures in our collection appears suddenly in a startling way we rather like. You may have had them, too, these private pictures, when you are driving a nail, or using a plumb-line to test the trueness of a wall. That is, if builders use plumb-lines now as Amos, of old, saw in his vision. Or you may see these pictures when you close your eyes for a rest from the tedium of some job.

You may like to do as we do, keep a collection ready to bring out when life is dull, and review the happy spots. Landscapes you know well because you traveled them with those you loved—not only people but animals, and birds, and all living creatures.

And some people remember best to travel back along the avenues of sound. To recognize people by their voices after long years. The voice can stay young and reassuring, and keep us from noticing other changes time has made. We can hear a mandolin from an open window and be transported in an instant to a little sea-coast town a thousand miles away.

It may be that is why silences can be felt and be so poignant.

We noticed it first this year when pear trees were in bloom—that strange silence so foreign to our valley.

Every year at the change of seasons when spring comes floating down our valley we think of her in sound. Wrens and redbirds chatting, and pewees chirping, "Hello! Here we are again, at our front porch, ready to build a new home by the center column, the one with the best view of your garden and orchard and through the windows—you!"

But aside from all these singing dialogues and chatting operettas, there are the spring sounds of the bees. Just let spring peep up over the horizon and

all outdoors is bathed, and drenched, and festooned in the soft, musical humming of the bees. The Golden Ones, we call them.

Their hives, miniature two-story houses of snowy white or weather-graying white—depending upon how long it has been since the painter renewed them—are arranged in a curving line just below the arc that marks the meeting place of our forests and the grounds about the house.

It is an advantageous location in more ways than one. From our standpoint we can look out from the house and see them in the moonlight draped in cooling, brown clusters on warm summer nights. Or by chance glances through the windows we are conscious of the bees always busy at work.

From their standpoint the location is ideal because the bees can shoot out from the hives in their swift, darting flights, and be above the traffic-lanes of mere humans. Their destinations are the valley meadows, where sweet clover and alsike may be growing and blooming; or the tree-covered hills that rise, across the valley, to the east, and the south, and the west. These hills furnish the bees a high, long-stretching, blossoming plateau of hardwood forest-trees.

It is an ideal bee flower-garden of poplar blossoms, tropical-looking in striking golds and rich browns. Myriads of d a i n t y, snow-white, lily-of-the valley-like sprays of sourwood blossoms, source of some of the mildest white honey the bees make for us. The sumac spots the plateau, with its graceful, scarlet leaves in early fall. Its tiny, greenish-white flowers supply nectar that makes a rich, gold, waxy honey. When it is being made the entire bee-yard has an enticingly strong aroma. The thick honey is bitter at first, but all that bitterness passes away when the bees have it cured, and we consider the sumac a rich treasure for the bees.

The location is good, too, when the field-bees drift back, heavy-laden, over the valley, high in the air, coming from the forest rim to their bee-village, with their loads of nectar, pollen, water and propolis. They settle down on their alighting-board, or door-sill of their home, with a tired contented hum, the day's work done, the last load in.

But This Spring it Was Different

Instead of busy up-and-coming, greet-the-morning hums, and mid-day, matter-of-fact, workman-like hums, and tired, satisfied, nectar-sated, end-of-the-day hums—instead of all these happy sounds—there was the strange silence.

We noticed it first, as I have said before, when the pear-trees were in bloom.

To us one of the satisfactions of saying farewell to winter is going to the orchard, across the highway, and walking lightly along, in and out, under the single row of pear trees there. We think of it as going to meet spring, a rendezvous we have with her.

When we have this rendezvous we never hurry. We like to pause along the row to touch the fragrant buds opening halfway white, halfway gold. We bury our faces in the lower branches and feel the cool silkiness of the petals. We drink in the fresh perfume of the promising buds and the shy blossoms. And we expect to have, as accompaniment to all this delight of the senses, the presence of the bees.

An army of brown and gold-striped bees gleaming in the sunlight; golden ones poised over thousands of pear-blossoms, and each one in the army singing fine bee-notes like rich tones of haunting violins. Bees and pear-blos-

"THAT ONE THAT LEANS LIKE THE TOWER OF PISA · · · THEY'RE THE ITALIANS."

soms seem to belong together. The creamy gold of the blossoms and the brown and gold of the bees blend as if they were made for one another, and there is a reminder of new honey in the perfume of the flowers.

There had been no springs for us without this music. Not until this one. Our father lived in this valley all of his life, and brought our mother, Angeline, there when she was 17 and introduced her to the never-ceasing fascinations, to them both, of the bee-life.

Before our parents, our grandfather brought our grandmother Judy Ann here when she was a bride. They established the bee-colony here when their life together was new. Before our grandparents' time, the valley was new, new as the Garden of Eden. No other family has lived here. Over 100 years our family has been here, and always there has been the hum of bees.

This strange silence—does it mean the close of one era of time and the coming of a new order?

The winter was long, but our bees have survived long winters before. The winter was cold, but always before this the bees, as an apiary, survived ice and zero-weather. Their houses nestle against the pine hill, a protecting windbreak on the north.

Knowing we left the honey undisturbed last year, because it was a bee-trying dry season, we had rested secure, with peace of mind, through the long winter. When icy winds swept down from Canada, Alaska, or Greenland—or some land of icebergs, snowdrifts and screaming blizzards—it gave us a

WALT DISNEY'S True Life Adventures
QUEENLY KILLER
© 1958 Walt Disney Productions World Rights Reserved
ONLY ONE QUEEN TO A HIVE! THAT IS THE LAW! HAVING RETURNED FROM HER NUPTIAL FLIGHT AND LAID HER FIRST EGGS TO PROVE HER RIGHT TO THE THRONE, THE NEW QUEEN GOES TO THE CELLS OF HER AS YET UNHATCHED ROYAL SISTERS. THE GUARDS STAND ASIDE TO LET HER DO HER DUTY--TO STING HER POTENTIAL RIVALS TO DEATH. UNLIKE HER 'STING AND DIE' SUBJECTS, THE QUEEN CAN STING AGAIN AND AGAIN.
Distributed by King Features Syndicate. 5-14

happy feeling to think the bees had plenty of food stored.

Then April came and the pear trees bloomed in silence; we thought there might be no nectar flow. At the water holes, where the lacy trim of crystal-clear ice was melting in the new sunshine, we noticed there was no fringe of bees, carrying away water.

Anxious then we went up the slope to the hives and paused, waiting by each entrance. Only two hives had bees going in and out, and they were slipping in and out again quietly, in a lonely-like way.

We have any amount of good new hives, supers, brood-chamber and super frames, inner boards, zinc covers, little nails, brushes, bases, bee-tools, and even foundation, both brood and super. Our parents had good quality supplies in abundance and we, in our enthusiasm, have added to them..

But aside from the two hives—the two lone colonies—they are gone, the Golden Ones. We could weep because we miss them so.

WHEN WINTRY WINDS BLOW—

(Continued from page 675)

ey, brown sugar and mustard with the liquid, mixing well. Place beans in bean pot or covered casserole. Lay scored pork and peeled and scored onion on top of beans. Add liquid. Cover and bake in slow oven, 300 degrees F. about 6 hours, adding more liquid, if necessary. Remove cover last half hour of cooking. Serves 5-6.

Honey Brown Bread

One cup whole bran cereal, ½ cup seedless raisins, 2 tablespoons shortening, melted, ½ cup honey, ¾ cup sour milk or buttermilk, 1 egg, 1 cup sifted flour, ½ teaspoon baking soda, 1 teaspoon baking powder, ½ teaspoon salt, and ½ teaspoon cinnamon.

Combine bran, raisins, shortening, honey, and sour milk; let stand until most of moisture is taken up. Add egg and beat well. Sift together flour, soda, baking powder, salt and cinnamon. Add to first mixture, stirring only until combined. Fill 2 greased cans, 4½ inches deep and 3¼ inches across, about ⅔ full. Bake in moderate oven, 350 degrees F. about 45 minutes. Slice and serve immediately.

Honey Drop Cookies

One and ¾ cups sifted flour, 1 teaspoon baking powder, ½ teaspoon soda, ½ teaspoon salt, 1 teaspoon cinnamon, ½ teaspoon cloves, ¼ teaspoon nutmeg, ⅓ cup soft butter, ½ cup honey, ¼ cup sugar, 1 teaspoon vanilla, 2 eggs, well-beaten, ½ cup sour cream, ½ cup chopped nutmeats, ½ cup cut dates, and 1 cup crisp rice cereal.

Sift together flour, baking, powder, soda, salt, and spices. Blend butter, honey, sugar, and vanilla until fluffy. Add eggs and sour cream; mix well. Stir in sifted dry ingredients together with nutmeats, dates, and cereal. Drop by level tablespoons onto lightly greased baking sheets. Bake in moderate oven, 350 degrees F. about 15 minutes. Yield: about 4 dozen cookies, 2½ inches in diameter.

A Carload of Honey a Year

H. H. ROOT, Medina, Ohio

IN THIS LAND of large mosquitos and tall stories I forgot my badly perforated neck when I met a barber who by working mostly mornings before his shop was open, produced a carload of honey a year. That sounded like a pretty good story but two days later, in Wyoming, at a banquet of beekeepers, I was astonished at hearing about the fabulous crops of honey. As I recall it now, there were about 75 present. Out of curiosity, I passed a paper around and asked every man to put down his average crop per year. Every one was a carload producer, as I reported in Gleanings at the time. It was not the largest beekeepers' meeting I had ever attended but in point of the total amount of honey produced per capita it topped the list.

Not wanting to be outdone in achievement, I raised a mustache while I was gone to see whether my wife would let me in when I got home. The night before I arrived, somewhat apprehensive of what she would say, I shaved it off. I was afraid it would remind her of the tall grass country in the West.

A Talk To BEEKEEPERS

M. J. DEYELL

Since an article on wintering bees out-of-doors appeared in the October, 1958 Gleanings and another article on wintering bees in cellars appears in this issue of Gleanings, it would seem appropriate to mention some of the experiments we have tried during the years in wintering bees inside and out.

DURING THE winter of 1922 and '23 we wintered five colonies out-of-doors in packed hives, each colony fed 10 pounds of sugar syrup. To make a comparison we wintered five colonies in packed hives with fall honey stores. The colonies were weighed on November 15, 1922, then again on April 25, 1923.

The average loss of weight per colony for the bees fed sugar syrup was 13 2/5 pounds. The average loss of weight per colony for the bees wintered on fall honey was 17½ pounds. The colonies fed on fall honey stores were not so strong in bees in the spring as the colonies fed sugar syrup late in the fall. The colonies with fall honey consumed on an average of over four pounds of stores per colony more than the colonies fed sugar syrup.

Another experiment was conducted to determine approximately how much stores bees consumed wintered in a cellar. We used nine colonies in this experiment. They were weighed and put into the cellar December 2, 1935, and were removed and again weighed on April 30, 1936. The average loss of weight per colony during the time they were in the cellar was 10 2/9 pounds per colony.

Carrying versus Hauling Bees to Cellar

To determine whether hives of bees carried carefully into a bee cellar winter better than bees hauled into the cellar, we carried in 10 colonies and hauled 10 colonies to a bee cellar November 24, 1923. All of the hives were carefully weighed. On April 17, 1924, when the hives were removed from the cellar, they were again weighed. It was found that the loss of weight during the winter, of colonies carried to the cellar, was an average of 8 17/20 pounds, while the average per colony

loss of bees hauled to the cellar was 10 3/20 pounds, which made a difference of 1 3/10 pounds in favor of bees carried to the cellar. The difference was not so much as we thought it might be.

Data on Packed and Unpacked Colonies Wintered Outside

On November 21, 1941, we weighed six two-story strong colonies of bees just before they were packed in asphalt paper, with four or five inches of fine straw between the paper and the hives. We also weighed six two-story colonies that were wintered without any packing. The 12 colonies were weighed again April 21, 1942, just after the packing had been removed from the packed colonies.

(1) Packed hives lost an average of 23¼ pounds in five months.
(2) Unpacked hives lost an average of 28½ pounds in five months.
(3) This means that the unpacked hive lost 5¼ pounds more than the packed hives.

On April 24 we checked all the colonies and found that the hives that had been packed had an average of brood in eight and one-half combs, while the unpacked hives had an average of brood in nine and one-quarter combs. The term "combs of brood" is different than the term "brood in combs".

It would appear that the difference in the loss of weight of the two sets of colonies may have been due to the bees in the unpacked hives using up more honey for brood rearing than the bees in the packed hives.

The Value of Good Winter Stores for Bees

During the winter of 1922 and 23 we made an experiment with 10 colonies of bees, five being fed sugar syrup and the other five wintered on honey, mostly fall honey. The bees were wintered in a bee cellar and were weighed November 15, 1922, and again April 25, 1923. The colonies fed sugar syrup lost an average of 16 pounds during the winter, while the colonies wintered on honey stores lost an average of 17 pounds. However, the colonies that were fed sugar syrup were stronger in the spring than the colonies with honey stores.

In our opinion, bees wintered on well ripened white honey, preferably clover honey, winter as well as bees fed sugar syrup. However, in areas where bees have access to late fall honey and are wintered in cellars, it pays to feed each colony at least one 10-pound pail of thick sugar syrup during late October. This helps to correct any poor quality stores resulting from an inferior honey that may be gathered late in the fall.

Two-Story Colonies in Packed Hives vs Two-story Colonies in Single-walled Hives

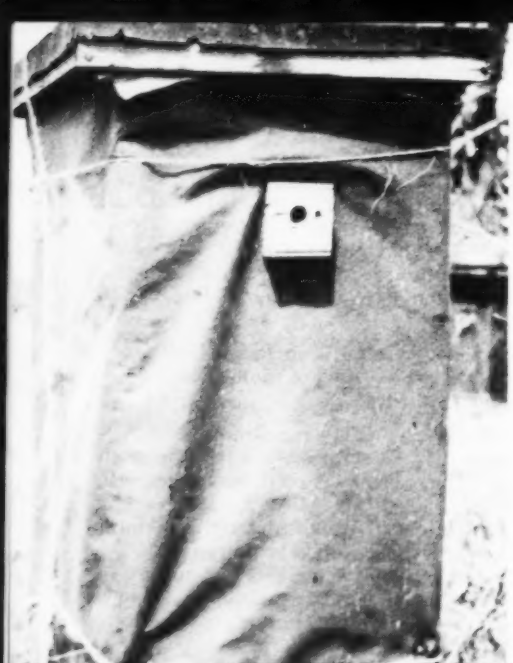
These colonies were wintered out-of-doors. Five colonies were used in each set. They were weighed November 10, 1939, and again May 3, 1940. The average loss of weight during the winter for the single-walled colonies was 31 pounds. The average loss per colony in packed hives was 23 pounds, making a difference of eight pounds per colony between the two sets.

It would appear from examining the results of the foregoing experiments that there is some value in protection or insulation for bees in cold climates during the winter months. It seems apparent that colonies of bees with packing, consume less honey during the winter than colonies not packed. In one of the experiments recorded, it will be noted that colonies that were not packed during the winter had slightly more brood than colonies that were packed. It may be a little difficult to account for this. We really should have extended this experiment until the end of the major honey flow to determine which of the two sets of colonies stored the more surplus honey. That is what beekeepers are interested in.

Pack Bees if Necessary

We do not pack hives of bees in this locality. We are about 41 degrees north. If we kept bees farther north where the weather gets very cold during winter, we would apply some winter packing. Some years ago it was customary to apply a considerable amount of winter packing, from four to six inches on the sides and ends of hives, and eight or ten inches on top. This involved a considerable amount of expense for packing material, also labor.

At present the consensus seems to be that colonies that are populous in bees, with an ample amount of good quality stores, properly placed, can be wintered



Shows paper wrap with small auger hole in piece of wood, leading to upper entrance. This hive has four inches of straw on top of inner cover.

successfully in the north, each hive wrapped in black building paper. This black paper absorbs some of the sun's rays.

Upper Entrances

It seems to be an advantage to have a small ¾-inch opening or auger hole near the top of each hive to help the bees expel some of the excess moisture that may accumulate during the cold weather. It is an advantage also to have each apiary located in a spot sheltered from the prevailing winter winds. Proper air draining is also important. Hives of bees in a low spot where the air does not flow freely, may result in poor wintering.

Some Beekeepers Pack with Honey

It is extremely important that each colony has an ample amount of good-quality honey properly placed. By this we mean that there should be plenty of honey in combs above the winter cluster, so that when the bees consume the honey in the portion of the combs where they are clustered, they can move up onto fresh stores.

If there is an insufficient amount of honey in the combs, the cluster of bees may reach the top bars of the frames and being unable to move sidewise or laterally onto fresh honey, due to a protracted cold spell, the cluster of bees may perish, with their heads in the empty cells. Most experienced beekeepers have seen this happen.

Very populous colonies with a superabundance of good quality honey properly placed, will live through a cold winter even in the north. Such colonies are likely to live even without any packing around the hives.

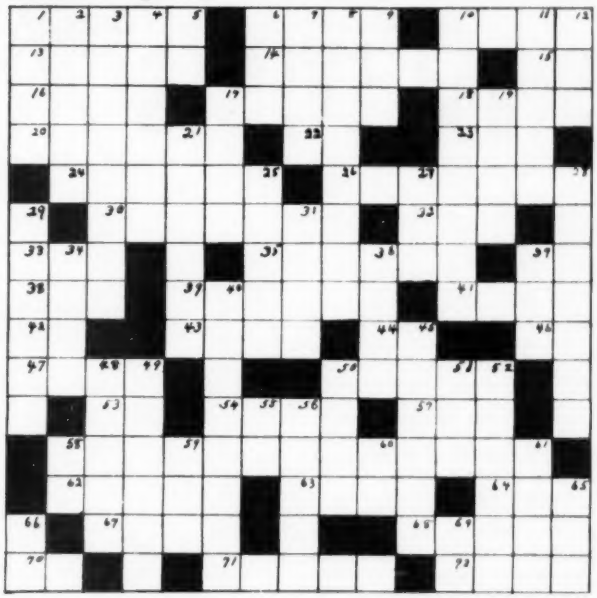
A Cluster of Bees Generates Its Own Heat

I have asked experienced beekeepers how their bees keep warm in the winter. They would usually say, "Oh they just huddle up together in cold weather". Bees are said to be cold-blooded animals which means that they are the same temperature as the air that surrounds them. However, bees can and do generate heat by muscular activity. This is done in the center of a winter cluster which is a marvelous phenomenon.

The following excerpt from an article entitled "An Interpretation of the Problems of Wintering the Honeybee Colony" by Dr. C. L. Farrar, Madison, Wisconsin, appearing in the September, 1943 issue of Gleanings in Bee Culture, contains authentic information concerning the winter cluster of bees:

"The winter cluster provides its own insulation against heat loss. The insulating shell of closely packed bees, filling the interspaces between combs and any empty cells, ranges from one to three inches in depth, and the more loosely grouped bees in the center generate heat. The temperature within the broodless cluster will vary above the minimum of 57 degrees and 60 degrees F, showing an increase or decrease which opposes within limits any external temperature change, whereas the surface temperature remains normally somewhere between 43 degrees and 46 degrees F. As the air temperature surrounding the cluster declines the cluster contracts, reducing the surface exposed to heat radiation, increasing the depth of the insulating shell, and concentrating additional bees in the center to generate heat.

Beekeeping Cross-word Puzzle



Solution will appear in next month's issue.

Mrs. R. P. SCHLABACH, Medina, O.

ACROSS

1. Surrounds comb
6. A drink made with honey
10. Many such in a bee yard
13. A vegetable (pl.)
14. Natural
15. State abbreviation
16. Always
17. Author of book on beekeeping
18. Rive
20. Bees buzz, birds ------
22. A specified amount (abbr.)
23. Ovum
24. Flowers for Easter
26. Pretentious house
30. Reprove
32. Pronoun, possessive
33. Room in a harem
35. Crescent shaped
37. Electric current (abbr.)
38. Soft metal
39. Exhausted of fertility
41. Pollen
42. Preposition meaning situation
43. Burden
44. Note of the scale
46. Short for a parent
47. A streak
50. Babies have this
53. Continent (abbr.)
54. Shakespearean king
57. Prayer (Latin)
58. Oldest beekeeping publishers
62. Scatter pollen
63. He, himself (Latin)
64. Article (German)
67. Souvenir of an angry bee
68. Rain -----s swarm
70. Biblical pronoun
71. Might do this to a hive or ring
72. Adverb—meaning this place

DOWN

1. How bees left the hive
2. Competitor
3. One born in the U.S.A.
4. Hard limestone
5. Plural ending
6. Russian village
7. Sufficient (archaic)
8. Support at either end of bridge
9. A speck
10. Not assayed
11. Queen bee
12. High crag
17. Direction to a horse (plural)
19. A protection or shield
21. Beam spanning a door
25. New drug
27. Insect egg
28. Drink for the Gods
29. A kind of candle
31. Was sorry for
34. Take food
36. Air, combining form
37. Reptile
40. Dummy frame
45. Ran away
48. Abbreviation for first two letters of 58 across
49. Limited in scope
50. Might be a clover one
51. Masculine name
52. Product of The A. I. Root Company
55. Conjunction (Latin)
56. ----- in honey
58. For instance
59. Above (poetic)
60. Manuscript (abbr.)
61. A period of time
65. Cereal grass
66. Next or near to
69. Interjection of inquiry

NEWS and EVENTS

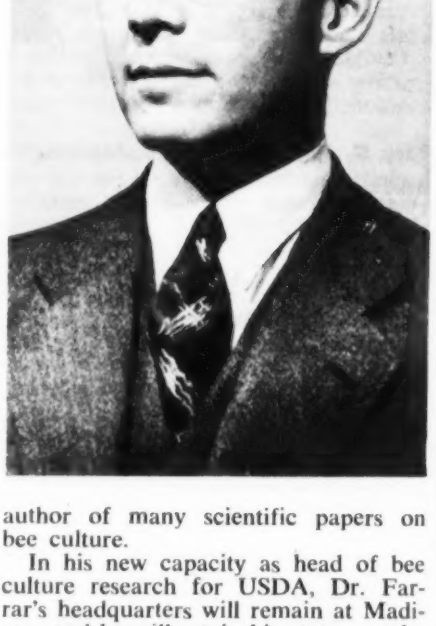
DR. CLAYTON L. FARRAR TO HEAD USDA BEE-CULTURE RESEARCH

Appointment of Dr. Clayton L. Farrar of Madison, Wisconsin, to head research on bee culture in the U. S. Department of Agriculture was announced September 19 by USDA's Agricultural Research Service.

Dr. Farrar will assume the post formerly held by Mr. James I. Hambleton as head of the Bee Culture Section of the ARS Entomology Research Division. Mr. Hambleton retired May 31 after nearly 37 years of service in the Department.

Dr. Farrar is a native of Abilene, Kansas. He obtained his B. S. degree in entomology and bee culture at Kansas State College, Manhattan, in 1926, and his doctorate in apiculture at Massachusetts State College, Amherst, in 1931.

Joining the USDA staff later in 1931, Dr. Farrar spent a few months at the Beltsville, Md., Agricultural Research Center. He was then transferred to USDA's Entomological Field Station at Laramie, Wyoming, where he engaged in honeybee management and disease research for several years.



In 1938 Dr. Farrar was transferred to USDA's bee culture station at Madison, Wisconsin, where he has conducted investigations in cooperation with the Wisconsin Agricultural Experiment Station on management and breeding of honeybees, and on the use of bees in the pollination of agricultural and horticultural crops. He has also served for several years as professor of bee culture on the faculty of the University of Wisconsin, where he has directed the graduate program for apicultural students. Dr. Farrar is author and co-author of many scientific papers on bee culture.

In his new capacity as head of bee culture research for USDA, Dr. Farrar's headquarters will remain at Madison, and he will retain his status on the University's faculty as instructor and advisor to students of bee culture.

Mr. Hambleton upon his retirement from the Department, was named a USDA collaborator on problems pertaining to bee culture. He is presently touring Europe with Mrs. Hambleton and recently attended the International

Beekeepers' Congress at Rome, Italy. There, as a USDA representative, he presented several scientific papers on studies he and his co-workers made at the Beltsville Agricultural Research Center. Mr. Hambleton is executive secretary of the Washington (D. C.) Academy of Sciences. He lives at Unity, Maryland.

TEXAS
Beekeepers' Association
77th Annual Meeting
November 10 and 11, 1958

PRES. JIM PETTY VICE PRES. LESLIE ATKINS
SEC'Y.-TREAS. CLAUD BURGIN

November 9, 1958 7:00 p.m. - 10:00 p.m.
"Beekeepers' Buzz"
Y.M.C.A. Building — Usual Place
Mrs. Alex and Mrs. Burgin will serve refreshments

Monday morning, November 10, 1958
8:00 to 9:00 Registration, Memorial Student Center, A. & M. College Campus.
9:00 Call to Order — Pres. J. R. Petty
Address of Welcome — R. C. Potts, Assistant Dean of Agri. Texas A. & M. College.
Response — Leslie Atkins
9:30 Address of the Pres. — J. R. Petty
Introduction of Visitors
Appointment of Committees
9:50 Production Costs — Bob Dadant
10:20 Panel Discussion: Honey House Plans
Moderator: R. Stanley Weaver, Raymond Fisher, O. G. Warne, Loys Milam, T. E. Kane, John Raefeli
11:20 Preparation of Honey for Retail Markets
Jim Petty, Moderator. Open Forum — Contributions from floor

Monday afternoon, November 10, 1958
1:30 Panel Discussion
Discussion of Bee Poisoning — Extent of losses, general observations, kind of poison used, how affected colonies were handled, and suggestions on how to avoid losses — Dr. N. J. Lewis, A. H. Alex, Howard Weaver, Oscar Eickenhorst, Binford Weaver
2:30 Royal Jelly — Production, Care of and Packaging — Dr. Nevin Weaver
Report on Royal Jelly Research Foundation E. B. Ault, Director
Problems in Production — Harvey Hatch
Marketing Royal Jelly — Howard Hatch
3:00 How to Build up Interest in a Local Beekeeping Association, Walter Barth, Erwin Glow
3:30 Report of Fair Committee — W. M. Allen
Reports from Representative of Local Associations: San Antonio District, North Texas Beekeepers' Association, Harris County Beekeepers' Association, Rio Grande Valley Beekeepers' Association, South Plains Beekeepers' Association
4:30 Promoting the sale of honey — Carr Smith, Sulphur Springs
What the Beekeeper's wife can do to promote honey — Ann Happ
7:30 Beekeepers' Banquet, Assembly Room, Memorial Student Center, A. & M. College Campus — R. Stanley Weaver, Toastmaster

Tuesday morning, November 11, 1958
8:30 Problems Resulting from the Application of Insecticides to Legume Crops
9:00 Report of Activities of the Women's Auxiliary for the past year — Ann Happ
9:20 Report of American Honey Institute Activities — Leslie Atkins
Report of American Beekeeping Federation Activities—C. C. Walker, Jr., G. O. Stroope
10:00 Report of TBA Committees
Resolutions Committees
Nominating Committee
Marketing Committee
Auditing Committee
Minutes Committee
10:30 Election of Officers
Selection of Delegates to the American Beekeeping Federation Meeting in Tampa, Fla.
11:00 Other Business
11:30 Meeting of Directors of TBA

SHORT COURSE FOR BEGINNERS
Tuesday Morning
November 11, 1958

9:30 Beginners meet in Room 209, Biological Science Building
Subject: Equipment and Supplies — A. H. Alex, Discussion Leader
10:30 Room 209, Biological Science Building
Subjects: Bee Behavior, Swarm Control, Seasonal Manipulations, Feeding Bees, Harvesting Honey, and Wax Rendering — Dr. Nevin Weaver, Discussion Leader

Tuesday afternoon
1:00 Room 202, Biological Science Building
Subject: Bee Diseases — C. J. Burgin, Discussion Leader

CALIFORNIA STATE
Beekeepers' Association
Long Beach, California
December 8 through 11

The 69th annual convention of the California State Beekeepers' Association will meet at the Lafayette Hotel in Long Beach, December 8 through 11. Since this convention follows the meetings of the Entomological Society of America, in Salt Lake City, we expect to have interesting reports from there. Dr. J. E. Eckert will speak concerning his recent work in Australia and his visits to the research laboratories of Europe. Many interesting speakers will be on the agenda with reports of experimental work carried on in Arizona, Riverside, and at the University of California at Davis. All who are interested are cordially invited to attend.—J. Allen Dyer, President, California State Beekeepers' Asso.

IOWA
Beekeepers' Association
Ames, Iowa
November 13 and 14

The annual meeting of the Iowa Beekeepers' Association will be held in the Memorial Union, Ames, Iowa, on Wednesday and Thursday, November 13 and 14, as an affiliated organization of the State Horticultural Society. A special meeting on marketing program has been set up for 7:00 Wednesday evening, November 12, in the Memorial Union. All interested are invited to attend.—F. B. Paddock, Ext. Apiarist.

TAMPA'S SHRIMP FLEET, largest in the world with more than 300 boats is a popular sight-seeing attraction as well as one of the City's major industries. Tampa News Bureau Photo.

AMERICAN BEEKEEPERS' FEDERATION MEETING
Tampa, Florida
January 25-31, 1959

TAMPA—The Sunshine State's second largest city and foremost industry center of Florida.

TAMPA—the only city in the world to be invaded and captured each year by pirates.

TAMPA—located in the area of two-thirds of Florida's citrus groves, which are most interesting to all beekeepers and honey producers, will be host to the American Beekeepers' Federation, the Apiary Inspectors of America and the Southern Conference, the largest of all beekeeping meetings, to be held January 25-31, 1959.

Make your arrangements now to attend these meetings.

Following the meetings, and in connection with the Florida State Fair and the Gasparilla Festival, the National Honey Show will be held.

Additional information concerning these meetings can be secured by writing Robert Banker, Secretary, American Beekeepers' Federation, Cannon Falls, Minnesota.

Information and entry blanks for the National Honey Show can be secured by writing Fred V. Oren, Superintendent, 2516 Silver Lake, Tampa 4, Florida.

Make your reservations now. The Hillsboro Hotel will be convention headquarters. Let's all make this the most outstanding beekeepers meeting ever held anywhere. Tampa and the Sunshine State welcomes you.—H. S. Foster, Chairman, P.O. Box 712, Auburndale, Florida

MIDWESTERN
Beekeepers' Association
Kansas City, Missouri
November 9, 1958

The Midwestern Beekeepers' Association will hold its regular meeting at the I.O.O.F. Hall, 812 Westport Road, Kansas City, Missouri, on Sunday, November 9, 1958 at 2:30 P.M. "Preparing the Bees for Winter" will be the topic for discussion. Movies and refreshments. Everybody welcome.—Carroll L. Barrett, Secretary.

ILLINOIS STATE
Beekeepers' Convention
Springfield, Ill.
November 1 and 2

The annual convention of the Illinois State Beekeepers' Association will be held in Springfield at the St. Nicholas Hotel, November 1 and 2. A cordial invitation to all.

MONTANA STATE
Beekeepers' Association, Inc.
Great Falls, Montana
December 5 and 6, 1958

Montana State Beekeepers' Association, Inc., will meet in the Park Hotel, Great Falls, Montana, December 5 and 6, 1958. This will be the first meeting held in the Northern part of the State. An invitation is extended to our Canadian beekeepers to attend as well as all beekeepers of Montana or any guests interested. Harry Rodenberg, Jr., member of the Executive Board of The National Beekeeping Federation, and Lester W. Hall, Director of same, will give reports. Mr. Giese, President is planning an interesting program.

Western beekeepers held a very successful and instructive picnic meeting at Hamilton, September 14, in Bitterroot Valley.—Mrs. O. R. Burdett, Sec.

GEORGIA
Beekeepers' Association
Tifton, Georgia
November 13

The 39th annual meeting of the Georgia Beekeepers' Association, will be held November 13th, in the auditorium of the Georgia Coastal Plain Experiment Station at Tifton, Georgia. —J. H. Girardeau, Jr., Sec.-Treas.

OREGON STATE
Beekeepers' Association
Portland, Oregon
November 14 and 15

The Oregon State Beekeepers' Association will hold its 39th annual meeting on November 14 and 15, at the Washington Hotel in downtown Portland. The program will begin with registration at 9 o'clock on Friday, the 14th, followed by business meeting, committee reports and announcements during the morning. A varied program is planned to interest every beekeeper throughout the convention, with a special tour late Friday afternoon, and an evening of pictures and social beekeeping. The program will be climaxed Saturday evening with the annual banquet. All beekeepers are welcome. — Oliver Petty, Sec'y.

WASHINGTON STATE
Beekeepers' Association
Tacoma, Washington
December 5 and 6

The Washington State Beekeepers' Association will hold its annual convention at the Hotel Olympus in Tacoma, Washington, on December 5 and 6.—Mrs. E. B. Purchase, Sec.

EMPIRE STATE
Honey Producer's Association
Syracuse, New York
December 5 and 6

The annual two-day meeting of the Empire State Honey Producers' Association will be held at the Onondaga Hotel, Syracuse, New York, Friday and Saturday, December 5 and 6, with the banquet Friday night. A program of interest and help for the commercial honey producer has been arranged, with Saturday afternoon's program for the hobbyist. All are invited to attend. —Mary Cary Trippe, Sec.-Treas.

MIDDLESEX COUNTY (MASS.)
Beekeepers' Association
Waltham, Massachusetts
November 29, 1958

Middlesex County Beekeepers Association (Mass.) will hold its regular meeting Saturday, November 29, 1958 at the University of Massachusetts Field Station in Waltham. A buffet supper in which members furnish home cooked foods made with HONEY will be enjoyed by all. At this meeting the club will commemorate its 25th year with a HONEY and Beeswax exhibit. Prizes will be awarded to the best four in each class of eight different classes. Last month at the October 25 meeting the Association celebrated National HONEY week with its regular harvest dinner catered by the famous "HICKS Caterer". At that meeting color slides taken at the summer meetings as well as those taken at the " Eastern Apiculture Society Meeting" at Amherst in early August were shown. Many well known people in the Bee World were shown including John Root and John Buchanan of "GLEANINGS in Bee Culture".—John H. Furber, President.

DAS IMKERBUCH and CARTEA STUPARULUI

From the facile pens of T. Bogdan and V. Petrus come to the Gleanings' desk two most interesting books "Das Imkerbuch" in German and "Cartea Stuparului" in Romanian. Both books are interestingly illustrated, both are happy combinations of scientific and practical beekeeping. Even to one who knows little or no German, but especially to one who has made some study of the language, a comparison of the terms is interesting. In German an uncapping knife is an **Imkermesser**, a Tangential honey extractor is **Tangentiale Honigachleuder**, a radial honey extractor is **Radiale Honigschleuder**, and a honey strainer is a **Honigsieb**. Wax is the same except in German it is spelled **Wachs.**

The authors of the above deserve great credit for their wide reading and for their painstaking unselfish efforts to promote beekeeping. The address is: T. Bogdan, Bucarest, Rumania.

HONEY INDUSTRY COUNCIL

The Honey Industry Council of America is pleased to announce through its Research Committee, Roy Grout, Henry Schaefer and R. B. Willson, Chairman, that a contract has been entered into with the University of Wisconsin whereby during the coming academic year a study will be made in the Department of Biochemistry of the influence of various carbohydrates, especially those of honey, on carbolic utilization and liver fat deposition.

The Council, one year hence, hopes to have scientific knowledge about honey that could be enormously valuable to our beekeeping industry, and we are hopeful that the University of Wisconsin will at about that time publish the results of this study. — R. B. Willson, Chairman.

An attractive 34-page book entitled **Honey's Nifty Fifty Recipes** has just been received from Mona Schafer, Home Economist, Manager of the California Honey Advisory Board, 2515 Huntington Dr., San Marino 9, California. The book is selling for 25¢ per individual copy, postpaid and 20¢ per copy in orders of 100 or more. Be sure to send for a copy.

SOUTHERN STATES
Beekeeping Conference
Tampa, Florida
January 26-27, 1959

The Southern States Beekeeping Conference that met last year in Winchester, Virginia will meet this year in Tampa, Florida, January 26-27, 1959, at Hotel Hillsboro. Further particulars will appear in the December Gleanings.

ARKANSAS
Honey Producers' and Packers' Asso.
Little Rock, Arkansas
November 20

The Arkansas Honey Producers' and Packers' Association will meet at the Lafayette Hotel in Little Rock at 9:30 a.m., November 20.

CELLAR WINTERING

(Continued frou page 682)

Frank Reisner, Fingal

Mr. Reisner has a concrete bee cellar with a wooden roof and ventilator. It was built specifically for wintering and is near his bee yard making it easy for him to wheel the bees right into the cellar. He winters about 30 colonies in single brood chambers. His loss last winter was almost 50 per cent. His average loss is from 10 to 20 per cent which is not too bad for single hive bodies. All of his bees are wintered in the cellar and none are left outside. Mr. Reisner leaves his bees in the cellar until fruit bloom in the spring, which is later than recommended.

Howard Cree, Inkster

The junior author has wintered approximately 160 colonies of bees in single hive bodies in the basements of two homes for several years. His comments follow:

"I have wintered in two house basements, one being occupied and the other vacant. I have found that in the basement of the vacant house the temperature was much lower and as a result the moisture problem was greater.

"One advantage in wintering in a basement is that less honey must be provided. I have found that if one makes sure of a good queen and goes into winter with young bees, not too large cluster is necessary. If the single hive body is heavy with honey, they will come through the winter with

plenty of stores. In fact, if you winter in single hive bodies, your moisture problem is less than in two hive bodies. However, you must make sure to have them good and heavy in the fall, even if you have to feed. In most cases, if wintered in singles it will be necessary to feed as soon as they are put out in the spring. It does require a thorough inspection in the early fall to make sure that every hive is just right. If this is done, I would recommend wintering in the basement in singles as this requires much less work in carrying them into and out of the basement as well as being drier. The moisture problem in basement wintering is the most important factor.

"I have experienced a loss of but five per cent and have had up to 50 per cent loss in the basement of a vacant house. One should not expect to get by on less than 10 per cent average loss in single hive bodies. However, if you consider the saving of honey with cellar-wintered bees as compared to the additional amount consumed by outside-packed colonies, you can afford a greater loss with cellar wintering. I believe the work involved in putting them in and taking them out of the cellar is no more, if as much, as packing.

A TALK TO BEEKEEPERS

(Continued frod page 690)

"Packing retards the rate of temperature change within the unoccupied hive space, but during a protracted cold spell the air temperature within the packed hive but away from the cluster may approach the outside temperature. The packed hive, by cooling off more slowly allows the bees time to contract their cluster to the most favorable position and density, but it may not benefit from a rise in the external temperature which allows the cluster in the unpacked hive to shift its position or the bees to make a brief flight".

Obituaries

LEROY C. KEET

Noted N. Y. Beekeeper Dies

ONE OF New York's most successful beekeepers, Leroy C. Keet of Watertown, died September 27 at the age of 71. He had successfully parlayed an original investment of $7 in 1909 into one of New York's most successful commercial beekeeping operations which he sold in 1949. Semi-retired at the time of his death, Mr. Keet was running 100 colonies for comb honey. His skill at comb and extracted honey production brought him fame. As a result, Mr. Keet, Dean of New York State beekeepers, was frequently in demand for his experienced expert opinions.

Roy Keet's success evolved from his complete understanding of bee behavior that enabled him to forsee the needs of a colony in advance. He developed a good practical swarm system that resulted in his harvesting of maximum honey crops. Failures were extremely few and far between. The Keet swarm control system, published in Gleanings in the late 30's, was based on the use of shallow supers. It was a modification of the famous Demaree method of swarm control.

Mr. Keet was a past president of the Empire State Honey Producers' Association and the Northern New York Beekeepers' Association. In his earlier years he was a frequent visitor at National Meetings also.

The veteran beekeeper had been a patient in the Good Samaritan Hospital, Watertown, N. Y. for 10 days prior to his death. He underwent an operation for a glandular ailment and apparently developed complications.

The home of Roy Keet was a beekeeping meeting place where visitors were always welcome. Commercial beekeepers, inspectors and hobbyists would always stop in for a visit. His many friends were countless, and they will greatly miss him.

Buy and Sell

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate: 18c per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month, preceding publication.

HONEY FOR SALE

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. THE HUBBARD APIARIES, ONSTED, MICHIGAN.

IOWA honey, one can or truck loads. RUSSELL D. SMALLEY, BEAVER, IOWA.

CLOVER extracted honey in sixties. ABRAM BRUBAKER, RT. 2, LANCASTER, PA.

MICHIGAN'S FINEST WHITE CLOVER HONEY. New sixties. Fully ripened. You'll be pleased. Sample 20c. JOHN McColl, TECUMSEH, MICH.

TUPELO, wild flower or buckwheat in 60's. Honey candy. LANCASTER COUNTY DUTCH GOLD APIARIES, 910 STATE ST., LANCASTER, PA.

FOR SALE—Clover honey in 60's. NORTH CENTRAL HONEY PRODUCERS LEAGUE, BARABOO, WISCONSIN.

FOR SALE—10 ton of white honey in new 60's, ready for table use. FOX VALLEY APIARIES, DE PERE, WIS.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We can not guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for cash only or on C.O.D. terms except where the buyer has thoroughly established his credit with the seller.

WANTED—All grades of extracted honey. Send sample and price. DEER CREEK HONEY FARMS, LONDON, OHIO.

CASH FOR BEESWAX. Write as to quantity and we will quote price. MEUNCH-KREUZER CANDLE CO., INC., SYRACUSE, N. Y.

WANTED—White extracted or comb honey. Send sample. MILLERSPORT HONEY CO., MILLERSPORT, OHIO.

BEESWAX WANTED—Highest prices paid in cash or trade for bee supplies. THE A. I. ROOT COMPANY, MEDINA, OHIO; COUNCIL BLUFFS, IOWA; SAN ANTONIO, TEXAS.

WRITE FOR SHIPPING TAGS and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25 per cent saving. WALTER T. KELLEY CO., CLARKSON, KY.

WANTED — Light amber clover, fall flowers, buckwheat and white clover. Send sample and lowest price. CLOVERDALE HONEY CO., FREDONIA, N. Y.

WANTED—Honey in 60 pound cans, also beeswax any quantity. L. E. ALLEN, TIPTON, MICH.

WANTED—Buckwheat and light amber honey. EASTERN FOOD PRODUCTS, 421 BEDFORD AVE., BROOKLYN, N. Y.

CASH for Amber and Buckwheat Honey. Best cash price for wax. HUBBARD, ONSTED, MICH.

HONEY WANTED—Wanted sample and prices for clover honey in ton lots. Must be light colored, mild, well ripened, heavy bodied and not heated. BOX 127, MIDDLEBURY, VERMONT.

WE BUY AND SELL fancy comb and extracted clover honey. List your offerings and needs. MAYHEW, CLARKSON, KY.

WANTED, chunk comb and extracted honey. Mail sample and price. STOLLER HONEY FARMS, LATTY, OHIO.

WANTED — Comb and extracted honey. WM. MARCH, R. D. 3, BOX 27, MANTUA, OHIO.

WANTED—All grades of extracted honey, cans or carloads. Send sample and best price. Cash. Michigan Beekeepers, I have lots of empty 60's, take and fill them up and save the price of the cans. HONEYMOON PROD. CO., 39 E. HENRY ST., RIVER ROUGE 18, MICH.

We render cappings, old combs and buy your beeswax. Shipping tags sent on request.—M. H. CARY CORP., 219 WASHINGTON SQUARE, SYRACUSE 8, N. Y.

HONEY WANTED for bottling, bakers including buckwheat. All types, in tins or drums, trailer loads. Send samples representing each lot. ALSO ROYAL JELLY. Write CHAS. E. FARRIS CO., 99 HUDSON ST., N. Y. City. Established since 1910.

FOR SALE

WRITE FOR CATALOG—Quality Bee Supplies at factory prices. Prompt shipment. Satisfaction guaranteed. THE HUBBARD APIARIES, Manufacturers of Beekeepers' Supplies and Comb Foundation, ONSTED, MICHIGAN.

THE BIGGEST BEE SUPPLY Catalog published (64 pages) free for the asking. Listing many items not found in other catalogs. No agents—buy direct and save 20%. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

Makers of ROBINSON plain and WAVY-WIRED foundation. Also render and buy beeswax. Order direct from manufacturer and save dealer costs. Shipping tags free. WAX WORKERS, INC., ITHACA, N. Y.

QUEENBEE PAINTING OUTFITS, $1.50. INTER-LOOKERS, $3.00 postpaid. SOUTHWICK APIARIES, WABAN, MASS.

FOR SALE—Model BH-10 Johnson Dovetailing Machine. Used very little and in perfect condition. $75.00 FOB Middlebury. BOX 127, MIDDLEBURY. VT.

FOR SALE—Cypress bee supplies, standard 8 or 10 frame. Tops, 50¢; bottoms, 50¢; shallow supers, 50¢. Will cut other supplies to order. C. L. STONECYPHER, HOMERVILLE, GA.

200 10-frame Italians, with one super, young queens State inspected. $2,000, A-1 shape. J. R. WEAVER, RT. 3, DYERSBURG, TENN.

CARTONS 1400 lithographed jar caps with big bee, 63 mm size fits 2 pound economy and others, $13.00; shipping weight 44 lbs., carton 100, only $1.00; shipping weight 4 lbs. Big stock selling below cost. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

BEE SHOP and two-family house for sale at Portland, Michigan. Natural gas, electricity, city water and sewer. 500 colony capacity. Some equipment and bees if wanted. A real opportunity in southern Michigan. RALPH BLACKMAN, 632 Broadway, DUNEDIN, FLA.

400 colonies bees all or any part, with or without supers. G. C. WALKER, PHARR, TEXAS.

BEES AND QUEENS FOR SALE

We use all possible care in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for certificate of inspection as a matter of precaution.

3-band Italian and Carniolan queens, $1.00. LUTHER PICKETT, EFLAND, N. C.

CARNIOLAN and CAUCASIAN Bees for 1958. Booking queens. Each, $1.00; 2-pound bees with queen, $4.00. 3-pound bees with queen, $5.00. LEWIS & TILLERY BEE CO., RT. 3, BOX 251, GREENVILLE, ALABAMA.

PACKAGE BEES and QUEENS 1959. Two extra good strains, Dadant Starline & Our Regular Stock. Write for prices and shipping dates. ALAMANCE BEE COMPANY, GEO. E. CURTIS & SONS, LA BELLE, FLA.

PACKAGE BEES & QUEENS, two and three frame nuclei by truckload, queenless packages and frame brood and bees. G. C. WALKER, PHARR, TEXAS.

BEEKEEPING BUSINESS, bees, modern shop, 2000 supers, excellent location. W. A. WALKER, PORT AUSTIN, MICHIGAN.

SEEDS

HONEY PLANTS our specialty. Catalog on request. PELLETT GARDENS, ATLANTIC, IOWA.

WANTED

WANTED—Apiary or equipment in Michigan. Must be disease free. Write Box 813, Gleanings in Bee Culture, Medina, Ohio.

MISCELLANEOUS

BEES REMOVED from house or tree or hive without touching either house or bees. Bees will then move honey into hive. Save property, honey, and bees with my method. Send $2.00 for details. Satisfaction guaranteed. GEORGE HAWKINS, RT. 1, LAWSON, MO.

1958 edition of our 112-page book "HOW TO KEEP BEES AND SELL HONEY" contains over 175 clear, sharp pictures and drawings, explains in easy to read style all you need to know to make beekeeping pleasant and profitable. Includes hitherto secret information on how to build low cost hot box to liquefy ten 60-pound cans of granulated honey over night, how to prepare wax for market and fairs, and how to make creamed honey. 75¢ postpaid. WALTER T. KELLEY CO., CLARKSON, KY.

ROYAL JELLY

ROYAL JELLY in capsules (with added vitamins). Box of 30 with 25 mg. Royal Jelly, $2.00, retails for $4.00. Box of 30 with 50 mg. $3.00, retails for $6.00. Bottle of 100 new pack 50 mg. without vitamins, $7.50. PRAIRIE VIEW HONEY CO., 12303 12th ST., DETROIT 6, MICH.

ROYAL JELLY, box of 30 capsules, 25 mg. each, $3.75, 10 boxes, $18.75, 50 mg. box of 30 capsules, $6.00, 10 boxes, $30.00. Special pack 50 mgm. bottle of 100, $6.50, box of 30 capsules, $2.75. SUNNYBROOK HONEY FARMS, 13600 LIVERNOIS, DETROIT 38, MICHIGAN.

ROYAL JELLY BEAUTY CREAM in $\frac{3}{4}$-oz. jar, $1.25 to beekeepers, retails for $2.50; 1-oz. jar, $1.50 to beekeepers retails for $3.00; 2-oz. economy size, $2.00, retails for $4.00. PRAIRIE VIEW HONEY CO., 12303 TWELFTH ST., DETROIT 6, MICHIGAN.

MAGAZINES

THE SCOTTISH BEEKEEPER (The official organ of the Scottish Beekeepers' Association.) Scottish in character, international in appeal. Annual subscription $2 post free. Sample copy from ROBERT N. H. SKILLING, F.S.C.T., 87 KING STREET, KILMARNOCK, AYSHIRE.

Archiv fur Bienkunde, International journal for Bee Culture and beekeeping economics. Founded in the fall of 1918. Oldest economic bee journal in the world. Praised again and again for its decades of independent leadership through many endorsements and advice as a valuable source also for the practice. Classic. Yearly DM 5.50. Any aspiring beekeeping friend will receive a sample copy. BIENE-VERGLAG, GIELBACK, LINDAU, GERMANY.

BEE WORLD, the international journal of the Bee Research Association published monthly, contains the latest research reports on bees and beekeeping. With Apicultural Abstracts it costs $5.50 per annum, or $6.00 including membership of the Bee Research Association. Apicultural Abstracts only $4.50 per annum from the Hon. Subscription Secretary, Bee Research Association, 10 BARNETT WOOD LANE, ASHTEAD, SURREY, ENGLAND.

AFRICAN BEEKEEPING, successor to the S. A. Bee Journal, monthly, sub. 10/- per annum. THE EDITOR, P.O. Box 4, Bergvliet, C. P., South Africa.

BEE JOURNAL of INDIA, published monthly in English. Subs. Rs. 12/-or Sh. 17/6d (starting) or $2.75 per year per International M.O. Sample copy 2s, or 25 cents. Can be had from: The Bhupen Apiaries (Himalayas), Ramgarh, Dist. Nainital, U. P., India.

GOAT MILK—Healthful food, profitable business, learn how. Monthly magazine $2. yearly. DAIRY GOAT JOURNAL, COLUMBIA T3, MO.

INTERESTED in Angora Goats? Read the Sheep and Goat Raiser, Hotel Cactus, Box 189, San Angelo, Texas, the only ranch magazine published serving the Angora Goat Industry. Subscription $3.00. Sample copy 25c.

YORK'S QUALITY BRED QUEENS

Dadant's Improved STARLINES or YORK'S Quality Bred Italians
PLUS
First and Finest Caucasian type hybrid — DADANT'S MIDNITES

Quantity	1-24	25-99	100 up
Italians	$1.00	$ .90	$ .80
Starlines or Midnites	1.30	1.20	1.00

Clipped and marked 15c each additional
The Preference of Leading Honey Producers

Reg. U. S. Pat. Off.

YORK BEE COMPANY JESUP, GEORGIA
(The Universal Apiaries)
P. O. Box 300 412 W. Orange Street Phone GArden 7-4131

We do not have queens running out of our EARS, but we believe our supply is and will be sufficient. Experience proves that re-queening pays. See that every colony has a young queen this fall, while queens are more available and cheaper than in the spring.

PRICES
Remainder of Season as Follows:

	Island Hybrid	Reg. Italian
1-25	$1.30 ea.	$1.00 ea.
26-99	1.20 ea.	.90 ea.
100-up	1.15 ea.	.85 ea.

"They Produce"

ROSSMAN APIARIES
P.O. Box 133 Moultrie, Ga.

Caucasian or Italian
QUEENS

Tops in quality, gentle and good honey producers.

Price

1 - 25	$1.00
25 - 50	.95
50 - 100	.90

FARRIS HOMAN
Shannon, Miss.

QUEENS

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Nice large queens, 80c ea.
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3 # 2 lb. Pkg.	24 lb.	1.64	1.92	2.33	2.89	3.53
1 # 3 lb. Pkg.	9 lb.	.90	1.00	1.15	1.35	1.59
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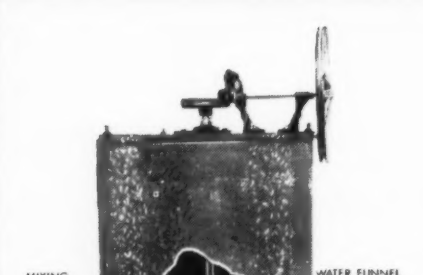

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